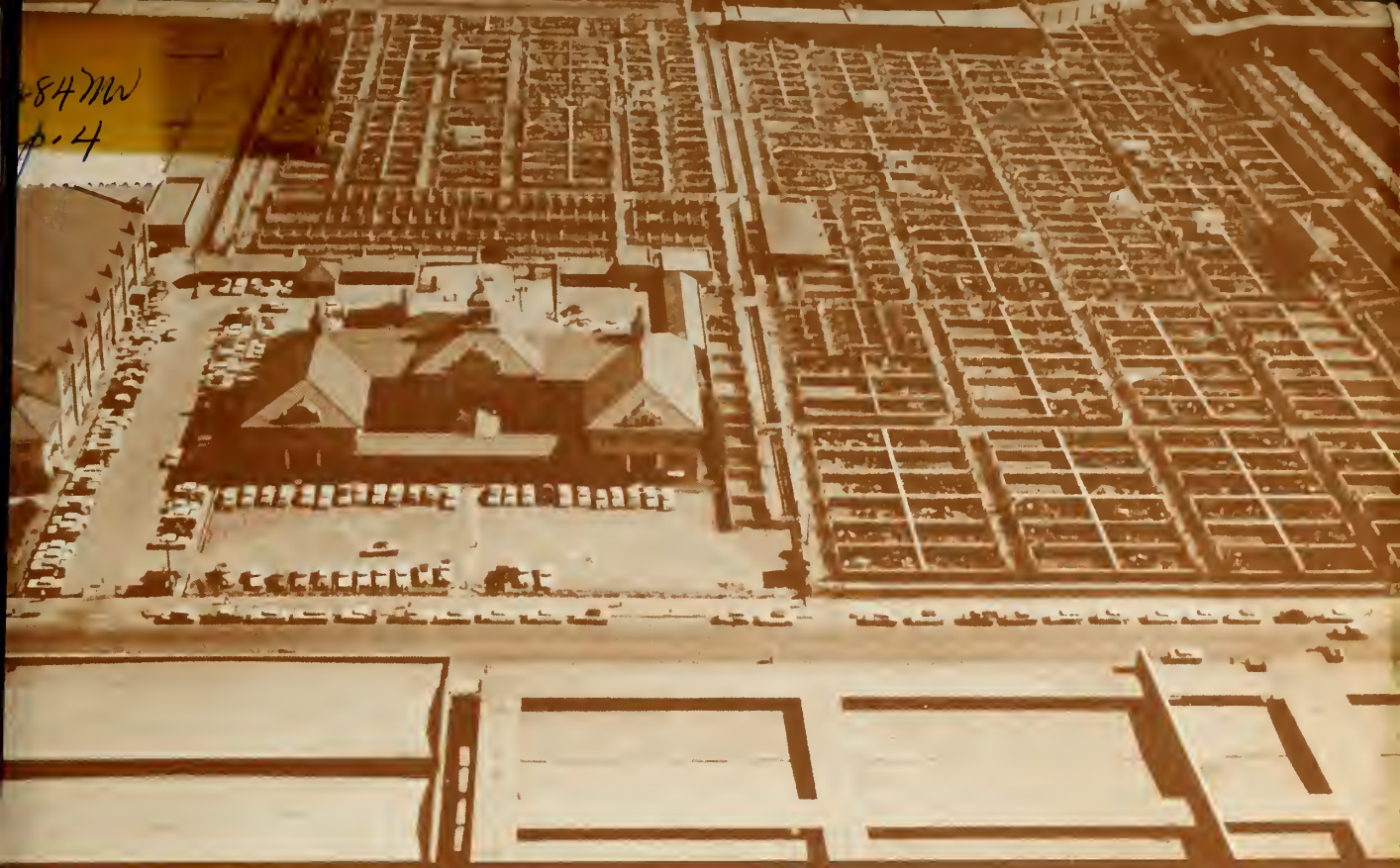

FORT WORTH STOCKYARDS 1955

proposed facilities, operations, services

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Marketing Research Division
in cooperation with
TEXAS AGRICULTURAL EXPERIMENTAL STATION

MARKETING RESEARCH
REPORT NO. 260

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PREFACE

Terminal stockyards are one of the oldest institutions in the marketing of livestock. Their history dates back for more than 100 years. During this period stockyards have been confronted with problems from time to time which affected their organization and operating efficiency.

This study of the Fort Worth Stockyards (a division of the United Stockyards Corp.) is a case study. It deals only with the physical plant and the operations of the stockyards in the handling and care of livestock in 1955. (In this report we have assumed that all facilities existing in 1955 are still in use.) The study does not deal with the operations of the selling agencies, or other groups on the market—neither does it intend to establish policies or relations for any of the various groups directly or indirectly connected with the market.

The study was undertaken to provide data and guidelines which may be used for improving facilities and operations of stockyards in light of current problems and estimates of benefits which might be derived from improved facilities and operations.

Results of this study might be applied by other terminal stockyards. The study is part of a broad program of research aimed at improving market efficiency and expanding markets for farm products.

The authors wish to thank W. L. Pier, division manager, and W. L. Joyce, assistant division manager, Fort Worth Stockyards, for making available the facilities and records of the Fort Worth Stockyards for the study. Acknowledgement also is made to supervisory and yard workers for their cooperation with the study.

The following statement was provided by Mr. Pier May 22, 1958, for inclusion in this report:

In its position as the leading livestock market in Texas, the Fort Worth Stockyards always recognized its continuing responsibility for improving service to livestock producers and buyers. Because of rapidly changing conditions the management of the Fort Worth Stockyards felt the need for an outside analysis of operations and therefore requested in 1955 that the Texas Agricultural Experiment Station and the United States Department of Agriculture make a comprehensive survey of the stockyards facilities and procedures.

These agencies made such survey with the cooperation of the stockyards. The completed analysis suggests a possible approach to the problem of stockyards management. Changes in facilities and operating procedures as recommended, require a very large capital outlay. Some of the recommendations in the report are necessarily theoretical in nature and would require further study on the part of the stockyards before determining which portions of said report are adaptable to the use of the Fort Worth Stockyards. Because time and changing conditions tend to devaluate the effectiveness of the report, it is considered desirable by the authors of the report to release it for immediate study.

The publication by the United States Department of Agriculture and the Texas Agricultural Experiment Station of this survey does not imply that the management of the Fort Worth Stockyards endorses all proposals or recommendations made therein, nor does management necessarily agree to the accuracy of the estimates of labor requirements, construction costs and savings. In this connection the Fort Worth Stockyards does recognize that the above named agencies have spent considerable time and effort in arriving at the data submitted in this report, and feels that from a technical standpoint much of said information may be very useful when given the test of practicability by management.

Management is very grateful to the authors for supplying this information as shown in said report, and it will be given management's earnest consideration when a program for improving facilities is initiated. Any program that tends toward increasing efficiency and saving in time and labor is most desirable of attainment.

Washington, D. C. Issued November 1958

CONTENTS

	Page
Summary	vi
Principles	vii
Introduction	1
Arrangement of present facilities	2
Yard facilities in the cattle division	2
Arrangement of facilities	4
Flow of cattle	4
Yard facilities in the hog and sheep division	4
Arrangement of hog facilities	5
Flow of hogs	5
Arrangement of sheep facilities	5
Flow of sheep	6
Present and proposed operations at the Fort Worth Stockyards	6
Cattle division	7
Receiving cattle by truck	7
Receiving and shipping cattle by rail	16
Weighing cattle	20
Keying cattle	27
Loading out cattle by truck	29
Water patrolling	31
Fire patrolling	33
Cleaning the division	34
Feeding	37
Maintenance services	37
Watchman services	38
Proposed labor pool	38
Other facilities proposed	38
Summary of present and proposed facilities and labor utilization	39
Hog and sheep division	41
Receiving hogs and sheep by truck	41
Receiving and shipping hogs and sheep by rail	46
Weighing hogs and sheep	48
Keying hogs and sheep	53
Water patrolling	55
Fire patrolling	55
Vaccinating and spraying hogs and dipping sheep	56
Cleaning the division	57
Feeding	58
Maintenance services	59
Watchman services	59
Proposed labor pool	59
Other facilities proposed	60
Summary of present and proposed facilities and labor utilization	60
Yard services	61
Feeding livestock	61
Maintenance services	68
Watchman services	69
Proposed central labor pool	71
Summary of present and proposed labor utilization	72
Comparison of present and proposed labor utilization in the Fort Worth Stockyards	72
Proposed arrangement of facilities at the Fort Worth Stockyards	73
Arrangement of proposed facilities in the cattle division	73
Flow of cattle through the proposed facilities	74
Arrangement of proposed facilities in the hog and sheep division	74
Arrangement of proposed hog facilities	74
Flow of hogs through the proposed facilities	75
Arrangement of proposed sheep facilities	75
Flow of sheep through the proposed facilities	75
Cost of constructing proposed facilities	75
Exchange building parking area	76
Cattle division	76
Hog and sheep division	77
Comparison of estimated cost of construction and benefits	79
Exchange building	79
Cattle division	79
Hog and sheep division	80
Appendix	81

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Summary

Improved facilities and operations can effect an estimated annual saving in labor to the Fort Worth Stockyards of about 176,000 man-hours. The estimated cost of the new facilities proposed to make this savings possible is about three quarters of a million dollars. The estimated savings in labor should pay for the cost of the facilities in a reasonable period of time.

Proposed operations and a proper work schedule for workers should permit a reduction in the work force at the yards from about 220 employees in 1955, to 135, a reduction of 85 workers, or nearly 40 percent.

In the cattle division the estimated annual savings to the stockyards in labor is about 137,000 man-hours. The estimated cost of facilities proposed in this division is about $630,000. In the hog and sheep division an estimated annual savings in labor of about 39,000 man-hours should result. Cost of new facilities in this division is estimated at $129,000.

There are a number of defects in the present facilities that cause inefficiencies in present operations. Poor utilization of pen space results from pens that are too large for consignments, and large work areas result from improper arrangement and size of facilities.

Present arrangement of receiving facilities necessitates long, out-of-line, and back drives of livestock, resulting in a confused, slow, and inefficient flow of stock through the yards. Scattered scale blocks are not readily accessible to all commission firms and dealers, requiring opening of all scales practically every day. Feeding, cleaning, and maintenance facilities are widely scattered, resulting in inefficient utilization of labor throughout the yards.

In the cattle division, improved facilities are suggested for receiving and loading out cattle by truck. Suggestions are made for two new buildings for hay storage at convenient locations. The number of sales, dealer, packer, and utility pens is increased by 41 percent in an area 6 percent smaller. The capacity of the pens would be increased from about 16,000 to 20,500 cattle—approximately 28 percent—by building smaller pens in line with sizes of consignments received at the market. Scale blocks would be reduced from 9 to 7. New location of truck docks would assure a straight flow of cattle through the yards.

In the hog and sheep division, similar changes are proposed, but to a lesser degree. The number of sales and packer hog pens would be increased by 8 percent in a slightly larger area. The capacity of the pens would be increased from about 14,400 to 15,300 hogs. The number of sales, dealer, packer, and utility sheep pens are increased by 21 percent in an area 5 percent smaller. The capacity of the pens would be increased from about 27,700 to 29,700 sheep. A new location is suggested for the truck docks for receiving hogs and sheep, but the number of docks proposed would remain about the same. Five scale blocks are suggested for the hog and sheep division—the same number as presently used.

Additional savings should result if the stockyard relinquished its lease of an area adjacent to the market now used for storage and maintenance.

Benefits should accrue to all groups operating at the market. If the areas for commission firms, dealers, and packers could be made as compact as suggested, shorter distances between work stations would reduce labor requirements significantly. Producers would benefit by spending less time in unloading livestock at the market. Losses from shrinkage and injuries would be minimized. Purchasers would benefit from reduced time and cost in assembling and driving livestock through the market to loading-out docks.

Principles

The major principles used as a basis for evaluating the facilities and operations at the Fort Worth Stockyards may be applicable at other terminal stockyards.

(1) Determine the sizes of the various yard facilities by the size of the lots of animals received, sold, and loaded out, for the best use of space and the greatest efficiency of market operations.

(2) Have the number of yard facilities and labor force large enough to handle the typical volume of business with a high degree of efficiency and still render reasonable service on peak volume days.

(3) Arrange yard facilities to provide for a direct flow of livestock into, through, and out of the market, with short drives between work stations, to keep labor requirements at a minimum.

(4) Arrange yard facilities to provide ready access to and through the market for people, vehicles, and livestock with minimum delay.

(5) Provide equipment for communications for immediate two-way contact with all work stations for prompt transfer of messages essential to efficient market operations and courteous service to market patrons.

(6) Substitute facilities and equipment for workers whenever it is economically feasible.

(7) Centralize similar operations and functions into compact work areas to provide for minimum labor requirements and adequate service.

(8) Combine small lots of cattle whenever practical for movement between work stations for the lowest labor requirements in handling.

(9) Shift workers to other jobs upon the completion of the original task to minimize idle or "bench" time.

(10) Protect facilities and livestock at all times to minimize losses from fire, theft, and vandalism.

(11) Maintain facilities in good repair.

(12) Consider the relation of each part of the yards with all others for maximum efficiency.

Fort Worth Stockyards, 1955: Proposed Facilities, Operations, Services

George E. Turner and Tarvin F. Webb,
agricultural economists
Marketing Research Division
Arthur F. Schramm, industrial engineer [1]
Livestock Division
Agricultural Marketing Service
and
John G. McNeely and Jarvis Miller,
agricultural economists
Department of Agricultural Economics and Sociology
Texas Agricultural Experiment Station

Introduction

The Fort Worth Stockyards is the oldest terminal livestock market in the Southwest. It has been a major market for livestock for more than 60 years. A vast and complicated organization, the operation includes the stockyards itself, 29 commission firms, 80 dealers, and 2 packers with packing plants adjacent to the yards. In addition, hundreds of sellers and buyers of all types including packers patronize the market.

The market's facilities are owned by the Fort Worth Stockyards.[2] This organization receives livestock arriving by truck and rail into the market. It weighs, feeds, and waters livestock, maintains and cleans the facilities, and provides watchman services for the yards. Commission firms account for and sell practically all the livestock consigned to the market for sale. They provide certain services in receiving cattle arriving by truck; water, feed, sort, sell, and drive consigned livestock to scales for weighing. Dealers buy and sell in their own account and also function as order buyers, buying mostly from the commission firms. Dealers feed, water, sort, and drive their livestock to the scales for weighing.

The two packers buy livestock from commission firms and dealers. They also purchase livestock elsewhere and have the livestock shipped to the yards. They use pen facilities to hold livestock and drive livestock on hoof from the market yards to their adjacent packing plants.

Certain functions performed by the 4 groups —particularly watering and feeding livestock —overlap, and in some instances no definite policy exists as to which group is responsible for some of the functions.

Over the years many changes have affected the organization and operating efficiency of the market. At one time, practically all livestock was transported to market by rail, and market facilities were designed and arranged to handle rail receipts efficiently. Today, practically all livestock is transported to market by truck. Although certain facilities have been rearranged and others have been added to meet this change, the facilities are generally not properly arranged for the most efficient handling of truck receipts.

The size of the lots of livestock consigned to the market for sale has shifted from large to relatively small. Formerly consignments of carload lots accounted for most of the receipts and livestock was handled and sold in large lots. Time and labor required to handle and sell large lots of animals are not much greater, if any, than that required to handle and sell small lots. Today small consignments are most common. Adequate facilities and work methods have not been developed to handle them efficiently. Consequently, the workload of the Fort Worth market has multiplied. The general trend is toward even smaller consignments. Proper facilities and work methods are mandatory if small consignments are to be handled and sold efficiently.

The volume of business at the market declines sharply from Monday through Friday of

[1] Mr. Schramm was on detail from Packers and Stockyards Branch for the duration of the study.

[2] The Fort Worth Stockyards is a division of the United Stockyards Corporation.

each week. This daily decline in volume has created a problem for the market.

Stockyard labor once worked by the day or by the week without any particular regard to the number of hours, or to job classifications. When the stockyards adopted the 8-hour work day, 40-hour week, and job classifications for its workers, work schedules and job alignments had to be made. Properly designed and arranged facilities which permit flexibility in their use are mandatory for proper scheduling of labor.

In 1955, the Fort Worth Stockyards, and various commission firms selling livestock in the stockyards, requested that research be undertaken on the major problems of stockyards operations. The research was begun in September 1955.

The research has 3 major objectives: (1) Develop plans for improved facilities, including their arrangement, design, and size, to permit greater efficiency; (2) develop improved work methods and procedures, to provide for maximum service to livestock shippers and other users of the market, and the greatest utilization of labor; and (3) measure the effects of the improved facilities and procedures against the present efficiency of the market.

A layout of the present market was prepared to show the use of facilities in 1955 by the different groups and the flow of livestock through the market. Observations were recorded of workers in the market doing specific jobs. Data were tabulated on the size of consignments, the time they arrived by truck or rail, and the use of pen space. The amount of direct labor used in performing specific jobs was obtained from employee time cards.

Data other than that collected on facilities were obtained on a sample basis, and the sample period consisted of four 7-day weeks. One week in each quarter of 1955 was selected, beginning with February. All data collected on a sample basis were expanded to yearly totals. The policy of the stockyards is to record the time charged to workers for performing specific jobs in 15-minute intervals. Labor data include the man-hours incurred on regular time and overtime, but not vacation time or time lost for illness. Labor data were obtained to provide a basis for estimating the benefits from improved facilities, arrangements, and operations.

Arrangement of Present Facilities

The Fort Worth Stockyards occupies about 90 acres in the north central section of Fort Worth, Tex. North Main Street and 28th Street form the west and north boundaries of the main market area: they are thoroughfares that intersect highways in all directions, making the stockyards easily accessible by truck. It is bounded on the east by the Fort Worth Belt Railway and is accessible by rail. Plants of two major slaughterers are located directly across the railway tracks, and each plant is connected to the stockyards by a viaduct (fig. 1). A small tract of land with several buildings west of North Main Street is leased by the stockyards to conduct market operations.

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Figure 1.—A viaduct for driving cattle from the yards to a packing plant.

The stockyards are divided into the cattle division and the hog and sheep division. These two divisions are separated by a street. A tunnel connects the two divisions. Livestock is driven from one division to the other without crossing the street.

Facilities are divided into two groups—office and yard. Office facilities include the Exchange Building, a building in which the superintendent is housed, and a building used as an employee locker room. The Exchange Building, which is located on a tract of land about 300 by 350 feet in the southwest corner of the cattle division, is a two-story structure with roughly 65,000 square feet of floor space. It provides space for the general offices of the stockyards, commission firms, dealers, packers, buyers, railroad traffic agents, Federal and State regulatory branches, livestock insurance companies, and affiliated market interests. The immediate area in front, back, and to one side of the Exchange Building is used for parking. The parking area is insufficient to meet the needs of market workers and patrons. The Exchange Building is the focal point, or clearing house, for all transactions in the yards (fig. 2).

Yard Facilities in the Cattle Division

Cattle division facilities include the truck dock approach, truck docks for receiving and

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Figure 2.—The Livestock Exchange Building at the Fort Worth Stockyards.

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Figure 3.—Small lots of cattle are frequently yarded in large pens.

shipping, a trailer alley, T-pens, rail docks, shipping pens, scale blocks, hay barns, grubbing, branding and vaccinating facilities, maintenance buildings, shelter houses, and holding pens. These facilities, with the exception of the holding pens, are discussed under the major operations in which they are used.

Holding pens include sales, dealer, packer, and utility pens. They are used directly or indirectly in practically all operations performed at the yards. In 1955, the cattle yards included 1,137 of these pens with 928,819 square feet of space. They can accommodate about 16,000 cattle.

Sales pens are assigned to commission firms by the Fort Worth Stockyards. In 1955 the 29 commission firms occupied 743 pens with an area of 485,426 square feet. Cattle handled by commission firms are called "market cattle." The number of pens and pen space assigned to each commission firm is based primarily on the number of cattle handled by the firm, and range from 2 to 67. Commission firms usually sell the cattle the same day they are received at the market. During 1955, 791,100 cattle passed through the sales pens of the commission firms.

A 10-day analysis of the use of the sale pen space, with daily receipts averaging 7,850 head, showed an average utilization of 61 square feet per head. This is almost double the amount of space needed. The pens are too large for the size of consignments received (fig. 3). More than half of the consignments received could use pens 10 by 15 feet or less. Only three of the pens in the market fall into this size group (table 1).

TABLE 1.—*Cattle division: Number of sales pens in the present market, by size groups* [1]

Pen size groups [2]	Sales pens	
	Number	*Percent*
10 by 15 feet	3	0.4
16 by 20 feet	127	17.1
20 by 21 feet	225	30.3
19 by 30 feet	75	10.1
20 by 34 feet	17	2.3
18 by 40 feet	55	7.4
24 by 33 feet	38	5.1
28 by 30 feet	57	7.7
24 by 40 feet	51	6.8
32 by 36 feet and larger	95	12.8
Total	743	100.0

[1] Throughout this report, "present" means 1955.
[2] The pens are put into the group of those nearest their size.

Dealers at the Fort Worth Stockyards buy most of their cattle from commission firms. In 1955, 77 dealers occupied 179 pens with 205,478 square feet of space. Dealer volume varies widely from day to day, and most dealer pens are too large for the volume of cattle. The dealers' use of pen space is not comparable with their use of either sales pens or cracker pens. Generally, the pens are too large for dealers to utilize their pen space efficiently. Under existing conditions, the dealer pens would hold about 2,500 cattle. Dealers handled about 330,000 cattle during 1955.

Pens are assigned to two packers for holding cattle purchased at the yards and elsewhere. Livestock purchased anywhere other than at the stockyards and shipped to the stockyard for handling is called "direct" livestock. In 1955, 96 pens with 111,399 square feet of space and a capacity of 3,700 cattle were assigned to packers. The size of the packer pens is in line with their requirements. Packer "direct" vol-

ume was about 215,982 cattle, and purchases at the stockyards were about 319,866.

Utility pens are unassigned pens reserved for use as the occasion demands. For the purpose of this analysis, 119 pens with 126,516 square feet of space and a capacity of 2,000 cattle are classified as utility pens.

Arrangement of Facilities

The tract of land for the cattle division is 1,200 feet across the north end, and about 800 feet wide at the south end (fig. 4).

The truck dock approach and facilities for receiving and loading, including T-pens, are located at the north end of the yards. Dealer pens are located almost directly behind the facilities for receiving and loading. Sales pens are divided into three major groups. One group is south of the dealer pens, another in the northeast part of the cattle division, and the third is in the southern part. Packer pens are divided into two groups. One group is in the eastern central part and the other is at the south end of the yards. Utility pens are located in the northwest portion of the yards west of the dealer pens.

The nine scale blocks are scattered among the four groups of pens. These scale blocks include scale pockets, scale platforms and houses, and catch pens. Catch pens are used to hold cattle after they are weighed and until purchasers call for them.

The rail dock is on the east side of the market, and extends the full length of the yards. Rail shipping pens are located alongside the north portion of the dock. Railroad tracks on land owned by the Fort Worth Belt Railway lead to the hay barns, continue through the yards, and divide the facilities in the cattle division.

The stockyards barn, used for maintenance purposes, is centrally located on the west side of the yards, while six hay barns are centrally located on the east side of the cattle division.

An undeveloped tract of land, which could be used for expansion, is located directly west of the stockyards barn. Branding and vaccinating facilities are located in the northwest corner of the division and the grubbing facilities in the southeast corner. These facilities are used infrequently.

Buildings used for maintenance purposes and the storage of hay are located on the tract of land across North Main Street. The tract also provides space for the storage of materials.

The water reservoir and manure dump are located on stockyards property but away from the main market area, across North 28th Street.

The present arrangement is one of scattered facilities with long distances between work stations, and divided areas for the same kind of work.

Flow of Cattle

Cattle received by truck are unloaded at the truck docks or trailer alley. From there the cattle are driven to T-pens (for temporary holding) or directly to sales and packer pens. Cattle driven to T-pens are subsequently driven to sales and packer pens. The flow of cattle from the truck docks to the pens is dependent on activities underway at the time of receipt. Regardless of volume, the arrangement of sales and packer pens in relation to the truck docks necessitates long and indirect driving of cattle, averaging about 1,500 feet.

Cattle received by rail are unloaded into chute pens. They are then driven either to rail shipping pens for holding, watering, and feeding, or to sales or packer pens.

Rail shipping pens are located near the rail docks and are arranged so that the flow of cattle from the docks is direct and short. Cattle being driven from rail docks to sales pens may have to cross the flow of cattle received by trucks, the flow of outbound cattle, or the flow of cattle to scale blocks.

Cattle are sorted and sold in the sales pen area by commission firms. After their sale, cattle are driven to scale blocks where they are sorted, driven onto the scale platform, weighed, and driven to catch pens. Cattle are driven to and from the nine widely scattered scale blocks in many different directions simultaneously. As a result, many alleys are not available for other uses while cattle are being weighed.

Purchasers collect their cattle from catch pens behind the scale blocks in all sections of the yards. Such cattle may flow in three directions. Cattle purchased by dealers are driven to dealer pens; cattle purchased by the two major packers are driven to packer pens and subsequently to their respective packing plants, cattle purchased by other buyers are usually driven to the truck docks for loading. In addition, cattle leaving by rail are collected from the purchaser pens or scale catch pens and driven to the rail shipping pens.

The flow of cattle from catch pens in each of the three directions, results in out-of-line drives, back drives, and crossflows. When the activities in the cattle division are at peak levels, it is possible for as many as 100 different lots of cattle to be moving in various directions at one time. This situation, in addition to the movement of feed wagons, buyers, sellers, spectators, and yard workers through the alleys, makes an uninterrupted flow of livestock through the cattle division difficult.

Yard Facilities in the Hog and Sheep Division

Facilities in the hog and sheep division are arranged on a tract about 1,000 feet square.

These facilities generally are similar to those in the cattle division, except that all hog and sheep facilities are under roof; part of the pen area is on a second floor; and the yard contains an immunization plant for hogs and a dipping vat for sheep.

The 213 sales and packer pens, with an area of 90,695 square feet, provide space for about 14,400 hogs. Ninety-nine sales pens with 21,090 square feet provide space for 2,800 market hogs. In 1955, 118,217 hogs were handled in the sales pens, which range in size from 10 by 10 feet to 20 by 30 feet. Although these pens are adequate, a few more small pens would provide maximum utilization of pen space.

One hundred and fourteen pens with an area of 69,605 square feet are assigned to packers. The pens will hold about 11,600 hogs. In 1955, packers handled 533,264 "direct" hogs through these pens. In addition, packers purchased about 98 percent of the market hogs that arrived on the market.

A total of 352 sale, dealer, packer, and utility pens, which provided 178,908 square feet of space, were available for sheep in 1955. Roughly, these pens can hold about 27,700 sheep. Frequently, 30,000 sheep will be on the market at one time during the 8 to 10 weeks of heavy receipts, and as many as 60,000 sheep have been received in one day.

The 261 sales pens contained 93,046 square feet, enough space to hold about 13,000 sheep. In general, sales pens are too large for the consignments received, and pen space is not efficiently used. Some 863,026 sheep were handled in these sales pens in 1955.

About 24,181 square feet of space was devoted to 28 dealer pens. These pens would hold about 2,000 sheep. About 215,000 sheep were handled in the dealer pens.

Some 59 packer pens with 57,901 square feet of space could hold about 12,000 sheep. Generally, the sizes of the pens assigned to packers are well in line with the size of consignments received. In 1955 packers handled through packer pens 204,000 direct sheep and 643,000 sheep purchased from commission firms.

Figure 4 shows the arrangement of facilities in the hog and sheep division. This division of the market was operating under the provisions of a quarantine that required strict separation of hogs and sheep.

Arrangement of Hog Facilities

The truck approach and docks used for receiving hogs and sheep are almost in the center of the south end of the hog and sheep division. The truck dock for receiving market hogs is on the east side of the approach and the truck dock for receiving direct or packer hogs is at the northeast end of the approach. The hog sales pens are divided into three groups. One group consists of the small sales pens, and is located just across the chute alley behind the truck dock for receiving market hogs. The second group of medium-size pens is behind the truck dock for receiving packer hogs; and the third group, consisting of the comparatively large-size hog sales pens, is behind the pens in the first group. The two groups of packer hog pens are on the first floor on the east side of the yards, almost in the center of the hog and sheep division, and on the second floor.

Two scale blocks are used for weighing hogs. One is used for weighing market hogs and the other for direct hogs. The scale block for weighing market hogs is adjacent to the sales pens, while the scale block for weighing direct hogs is adjacent to the packer hog pens on the first floor.

Although the rail dock runs the full length of the hog and sheep division, only the northern portion is used for receiving and shipping hogs by rail.

Flow of Hogs

Market hogs arriving by truck are checked, unloaded, and driven to the sales pens. The drive from truck docks to sales pen is relatively short and direct.

Market hogs are sorted and sold in the sale pen area by commission firms. After being sold, the hogs are driven to the scale block, sorted into weighable lots, weighed, and driven to catch pens or packer pens. Very few hogs are loaded out of the market.

Direct hogs received by truck are checked and unloaded at the truck dock designated for receiving such hogs. They are then driven to the scale block, weighed, and driven to packer pens. The location of the scale block necessitates an out-of-line drive, but the drives are comparatively short.

Direct hogs received by rail are handled similarly to those received by truck. The location of the scale block for weighing direct hogs in relation to the rail dock and packer pens necessitates a back drive. In general, the flow of hogs through the hog section is characterized by comparatively short, direct drives. Back drives and out-of-line drives are infrequent.

Arrangement of Sheep Facilities

Truck docks for receiving sheep are located at the northwest end of the truck approach. Directly to the rear of the truck docks are pens for temporarily holding small lots of sheep. Frequently, these T-pens are used as sales pens. Sheep sales pens are grouped almost in the center of the hog and sheep division. Dealer sheep pens are grouped in the northwest corner of the hog and sheep division. Packer sheep pens are divided into two groups. One group is located in the southeast section of the division, adjacent to the hog sales pens; and

the other is located on the opposite side of the division. Utility sheep pens are located on the west side of the yards about the center of the division.

Three scale blocks for weighing sheep are scattered among the sales pens. Catch pens for two of the scale blocks are located on the second floor, and catch pens for the other scale block are located at the extreme southwest corner of the hog and sheep division.

The central and southern portion of the rail docks are used for receiving and shipping by rail. Sheep shipping pens are located at the southeast corner of the division.

Flow of Sheep

Sheep are unloaded at the truck docks, and driven to sales or packer pens. Frequently, small lots of sheep are driven from the truck dock to the T-pens and subsequently to sales and packer pens. In some cases T-pens are used as sales pens. Many of the sheep sales pens are close to the truck dock; however, some of them are distant enough to require relatively long and out-of-line drives. Sheep received while weighing is in progress cross the flow of sheep being driven to scale blocks.

Sheep received by rail are unloaded into chute pens. From these pens the sheep may be driven either to packer or sales pens. Some of the drives from the rail dock to some of the sales and packer pens are comparatively short and direct, and some are comparatively long. Some out-of-line drives are necessary.

Sheep are sorted and sold in the sales pen area by commission firms. They are then driven to scale blocks, sorted into weighable lots, driven onto the scale platform, weighed, and driven to catch pens. In many instances, the arrangement of the scale blocks necessitates long out-of-line drives. The catch pens for two scales are located on the second floor. The arrangement of the catch pens in relation to scale platforms causes many long drives, out-of-line drives, and back drives, in yarding sheep.

Purchasers collect their sheep from catch pens in the scale blocks. Sheep purchased by dealers are driven to dealer pens and sheep purchased by packers are driven to packer pens or to the adjacent packing plants. In many cases, the arrangement of dealer and packer pens and the alleys leading to packing plants in relation to the catch pens and sales pens causes long out-of-line drives that encounter a crossflow with sheep being received into the market or sheep being driven to the scale blocks.

The flow problems in driving sheep to the truck and rail docks for loading are similar to those described for receiving.

Present and Proposed Operations at the Fort Worth Stockyards

Most of the operations performed by the stockyards are concerned with the physical handling, care, and movement of livestock through the market. Livestock marketing operations have certain inherent characteristics. Some of them are: (1) Livestock are unpredictable and may react differently in comparable situations. This means a high degree of variation in the time and effort required for specific operations. (2) Livestock must be handled promptly. For example, animals on truck and rail cars have to be unloaded immediately upon arrival to minimize loss from shrinkage and injury. (3) The workload for specific operations is highly erratic and unpredictable. Few operations last for 8 hours. An almost constant shift of workers between operations is mandatory for efficiency. (4) Because of the promptness with which livestock operations must be performed, labor productivity may be higher for short durations than could be expected over long periods. (5) Practically all the operations are service operations. The amount of service needed to satisfy one customer may be inadequate for another.

These characteristics of livestock market operations cause the labor load for specific operations to be based partly on an analysis of the workload and partly on judgment as to the amount of services which should be rendered to satisfy customers. Unavoidable delay time or "bench" time, as it is commonly called, is an inherent characteristic of terminal market operations.

Operations at the Fort Worth Stockyards are divided into three major divisions: (1) Cattle division, (2) hog and sheep division, and (3) yard services.

Operations in each of the major groups are discussed from the standpoint of facilities used, workloads, operations and labor utilization, proposed facilities, proposed operations and labor utilization, and comparison of present and proposed labor utilization showing estimated labor savings resulting from improved facilities and operations.

The proposed facilities are based on research and observations of facilities in use on terminal stockyards. The suggested operations and the estimated labor requirements for performing the operations with improved facilities are based on the analysis and observations of present operations in the stockyards, observations of operations in other terminal stockyards, and judgments of the observers.

The proposed facilities are for the same

number of users that were operating on the market in 1955. The proposals made regarding operations and estimated labor requirements are based on the 1955 volume.

Estimated crew sizes are suggested for performing each proposed operation with improved facilities. Because of the sharply declining workload which occurs during the week, an assumed work schedule showing the estimated number of workers required to perform operations for each day of the week was developed for a typical week (table 80, Appendix). This schedule also shows the estimated number of man-hours of labor required to perform the various operations with improved facilities. It is the judgment of the observers that the labor suggested with the proposed operations and improved facilities could render the same high standard of services to market patrons that is now being rendered with present operations and facilities. The estimated labor requirements for each operation for the typical week are expanded to obtain annual requirements. The estimated animal labor requirements for each operation are compared with the labor used in performing the operation in 1955 to show the estimated benefits which might result from the use of the proposed operations and improved facilities. The work schedule would not meet practical operating requirements. It would be beyond the scope of this study to develop a work schedule which would meet all actual operating variables.

The proposals made in the work schedule for obtaining labor from regular scheduled operations to perform sporadic and periodic jobs is for comparative purposes only. Many combinations may be possible. Actually, labor for sporadic and periodic jobs would be obtained from any source where labor could be made available when it was needed.

Cattle Division

Receiving Cattle by Truck

Present facilities

Facilities used in receiving cattle by truck are: A truck dock approach, truck dock, a trailer alley, T-pens, 2 buildings, and sales and packer pens. Dealer and utility pens are also used to a much lesser extent.

The truck dock approach which serves both the inbound and outbound trucks is an unpaved roadway about 670 feet wide and 110 feet deep. The west half of the approach is used for trucks arriving on the market with livestock, and the east half is used by trucks being loaded out. The truck approach provides adequate space for large trucks to turn and back into the docks and for farm trailers and pickups to use the trailer alley.

A truck dock having a platform about 5 feet deep and 15 chute pens about 16 feet wide and 22 feet deep is used for receiving cattle from large trucks (fig. 5). This dock is well designed and constructed and permits a high degree of unloading efficiency.

BN-6079

Figure 5.—Truck dock for receiving cattle arriving on the market.

The trailer alley, which is also the chute alley for the truck loading-out docks, is about 14 feet wide and 350 feet long. Since pickups and trailers arrive with cattle in large numbers early in the morning, and since heavy load-outs are made in the afternoon, the alley can be used for both operations without one interfering with the other. The trailer alley has a capacity of 8 to 10 farm trailers and pickup trucks at one time, and frequently that many are in it. Although individual trailers are unloaded quickly, the movement of trailers out of the alley may be restricted by other trailers (fig. 6).

T-pens for holding consignments of cattle temporarily to equalize the workload are located behind the truck docks and trailer alley. Seventy T-pens are behind the truck docks. These pens range in size from 16 by 16 to 20 by 40 feet. They comprise a pen space of about 24,384 square feet. The pen sizes are not sufficiently variable to handle efficiently the consignments from large trucks.

Forty T-pens are located behind the trailer alley. These pens are about 20 by 20 feet, and provide a total area of about 11,224 square feet. Generally, these pens are too large for the consignments of cattle received by farm trailers and pickup trucks.

The 2 buildings used in receiving cattle are about 18 by 20 feet. The chute house provides office space for yard clerks, and the other is a shelter house primarily for yard employees,

BN–6080

Figure 6.—Unloading trucks in the trailer alley.

truckers, and shippers. Both buildings are substantial structures.

Holding pens used in receiving cattle by truck are discussed elsewhere in this report. The average distance of the pens from the truck dock or trailer alley is about 1,500 feet.

Receiving workload

Cattle arrive by truck at the market 24 hours a day, 7 days a week. The day for receiving cattle is divided into three 8-hour periods. The first shift is from 7 a. m. to 3 p. m., the second from 3 p. m. to 11 p. m., and the third from 11 p. m. to 7 a. m.

Cattle are received into the market by consignment. A consignment normally represents the number of cattle belonging to one owner. Occasionally, however, an owner's lot is divided into two or more consignments. A number of factors affect the workload. The size of the consignments arriving on the market varies widely. In 1955, a total of 102,431 consignments with 988,614 cattle were received. The average consignment was 9.6 cattle. However, 40 percent of the consignments contained from 1 to 3 cattle, 12 percent from 4 to 5, 16 percent from 6 to 10, 18 percent from 11 to 20, 9 percent from 21 to 30, and only 5 percent of the consignments had more than 30. Fifty-two percent (52,995) of the consignments contained only 13 percent (127,510) of the cattle. Thus, 13 percent of the cattle accounted for about 52 percent of the workload. Time and labor required to receive large and small consignments into the market are about the same. Therefore, the workload of the market in receiving cattle by truck is determined by the number of consignments rather than the number of cattle.

The number of consignments of cattle arriving on the market by truck varies by weeks, by work shift, by day of the week, and hour of the day. The type of truck also affects the workload. Large trucks come to the truck dock, small trucks to the trailer alley.

The number of consignments arriving weekly averaged 1,970 in 1955. However, the number of consignments received was below average 70 percent of the weeks. Below average receipts may be received during any week of the year. They are most common, however, during December, January, February, March, and April. The number of consignments arriving weekly ranged from a low point of about 1,000 to a high point of approximately 3,000.

Thirty-three percent of the consignments arrive on the first shift, 43 percent on the second shift, and 24 percent on the third shift. The largest number of cattle (46 percent) arrive on the second shift; 21 and 33 percent of the cattle arrive on the first and third shifts, respectively. On the second shift the workload is fairly evenly distributed, while the workload on the third shift is concentrated toward the end of the shift. On the first shift the workload is concentrated at the beginning of the shift.

The largest number of consignments and cattle arrive on Sunday, Monday, and Tuesday. On Wednesday, the number declines almost 50 percent and on Thursday, Friday, and Saturday the number arriving on the market is comparatively light (table 2).

The number of consignments arriving varies by hours of the day and days of the week. In general, a heavy arrival may be expected on Sunday afternoon beginning about 2 p. m. and ending about midnight. On weekdays consignments do not begin to arrive in volume until 5 p. m. Heavy arrivals may be expected between 6 and 9 a. m. Between 9 a. m. and about 5 p. m. each weekday the number of consignments arriving is comparatively light. The same condition exists between midnight and 6 a. m.

Sixty-five percent of the consignments with

TABLE 2.—*Receiving cattle by truck: Consignments of cattle received daily, 1955* [1]

Day	Consignments		Cattle	
	Number	*Percent*	*Number*	*Percent*
Monday	26,341	25.7	227,131	23.0
Tuesday	25,684	25.1	225,456	22.8
Wednesday	14,699	14.3	127,391	12.9
Thursday	7,309	7.1	80,846	8.2
Friday	2,736	2.7	39,561	4.0
Saturday	3,437	3.4	48,726	4.9
Sunday	22,225	21.7	239,503	24.2
Total	102,431	100.0	988,614	100.0

[1] Each day's receipts cover a 24-hour period beginning at 7 a.m.

89 percent of the cattle arrived on large trucks, and 35 percent of the consignments with 11 percent of the cattle arrived on small trucks. More consignments of cattle arrive on small trucks during the early morning hours—usually between 6 and 9 a. m.—than any other period of the day. Furthermore, the number of consignments arriving by small truck is larger on Monday, Tuesday, and Wednesday than any other day.

Operations and labor utilization

Cattle arriving by truck are unloaded into the chute pens or trailer alley. They are driven from the chute pens or trailer alleys to T-pens for temporary holding or directly to holding pens in the yards. Cattle temporarily yarded in T-pens are subsequently driven to holding pens. The jobs performed in receiving cattle by truck are clerking, checking, counting, and driving. The size of the crew for these jobs varies by days of the week and also by hours of the day, with the number of workers in a crew varying from 2 to more than 20 workers within a 24-hour period. Generally, the labor load is considered geared to a workload of about 2,000 consignments per week, since that is the point where overtime begins to be used to any appreciable extent.

The work day for the receiving crew is divided into three standard shifts. Intermediate shifts are established for some jobs. Workers in one job classification are not permitted to work in another job classification in the receiving of cattle by truck, but workers within each classification often help each other. Workers in certain job classifications frequently are shifted to all parts of the yards to do odd jobs and are then shifted back to the truck dock. The receiving jobs are supervised by a foreman.

CLERKING.—The clerk receives all waybills, checks for completeness and inserts data when necessary, and maintains a running record of incoming receipts by commission firms and packers. He maintains records on crippled and dead cattle, computes the day's total receipts, delivers waybills to the general office, and summarizes outbound clearance cards.

The clerking job is performed 24 hours every day. The week is divided into 21 shifts, and one worker clerks for each shift. To use labor efficiently on days when the volume is light, clerking and checking are combined for 6 shifts, beginning with the second shift on Friday and ending with the second shift on Sunday, and 1 worker performs both jobs. Four hours of each of these six shifts are charged to clerking and 4 hours to checking. The labor used in 1955 for clerking amounted to 7,797 man-hours—or 0.08 man-hour per consignment. The labor used varied by shifts—2,496 man-hours were expended for clerking on the first shift, 2,493 on the second shift, and 2,808 on the third shift.

The clerking job is not related to volume. The amount of labor used for clerking is about the same each week throughout the year. Based on our observations, it appears the worker could absorb other clerical work, or the work of the clerk could be absorbed by other clerical workers.

CHECKING.—The checker receives the waybill from the shipper, checks for accuracy and completeness, unlocks the chute pen gate, counts the cattle as they are driven from the truck into the chute pen. He checks the count against that recorded on the waybill, locks the chute pen gate, records the chute pen number and the time of arrival on the waybill, signs the waybill and places it in the waybill box at the "out" end of the chute pen (fig. 7). During the first shift, the checker gives a copy of the waybill to the driver employed by the various commission firms. The commission firm drivers are responsible for driving cattle to sales pens on this shift.

BN-6081

Figure 7.—Checking a load of cattle in the chute pen.

Checkers are not required to help unload cattle or fill out waybills, but they occasionally do both of these jobs.

Checkers are stationed at the truck dock and trailer alley. The number of checkers at each station varies considerably due to the trend in receipts at the two stations. Receipts are heavy at the trailer alley during the early morning hours and relatively light during other periods. Heavy receipts arrive at the truck docks from 5 p. m. to midnight. Workers are assigned to meet these heavy workloads. Checkers may be transferred between the two work stations during the early morning hours. Workers are

usually fixed to their respective work stations on the second and third shifts and at least 1 worker is usually at each station.

The checking job is performed 24 hours each day of the week. From 3 p. m. Friday afternoon until 3 p. m. Sunday afternoon, checking and clerking are combined, with one worker doing both jobs. This is a job classification known as clerk-checker and 4 hours per shift are charged to each job. This is done to minimize labor over the weekend, when the workload is light. The remainder of the week, 3 p. m. Sunday afternoon to 3 p. m. Friday afternoon, 4 intermediate shifts have been established in addition to the 3 standard shifts. These shifts are 5:15 a. m. to 1:15 p. m., 1:15 a. m. to 9:15 a. m., 5:15 p. m. to 1:15 a. m., and 6 a. m. to 2 p. m. These shifts were set up in an effort to balance the labor load with the workloads. The 1955 labor used for checking amounted to 22,052 man-hours, or 0.22 man-hours per consignment. The labor used varied by shifts—8,278 man-hours were used checking consignments of cattle on the first shift, 6,221 man-hours on the second shift, and 7,553 man-hours on the third shift.

A job analysis was made for 3 checkers on the second shift. Two of the workers were located at the truck dock, and 1 worker was located in the trailer alley. Thirty-nine percent of the time of the workers at the truck dock was spent checking consignments of cattle. The average time required to check a consignment was 0.06 man-hour. Sixty-one percent of these workers' time was spent waiting for cattle to arrive. The worker in the trailer alley spent 56 percent of his time checking consignments, the remainder waiting for consignments to arrive. The average time required for this worker to check a consignment was 0.07 man-hour. The workload of 157 consignments checked by the three workers was typical for the day of the week the analysis was made. This analysis indicates that fewer workers could have performed the job satisfactorily.

Records for a typical week showed that the average time used per consignment was 0.20 man-hour. There was considerable variation between days of the week and shifts of each day. Labor used ranged from 0.12 man-hour per consignment on Sunday to 0.64 on Thursday. Labor used by shifts ranged from 0.15 man-hour on the second shift to 0.25 on the third shift. These data indicate that more checking labor is used on the first and third shifts than is needed and that labor is not withdrawn from the checking job as fast as the volume declines during the week.

COUNTING consists primarily of taking the waybill from the box at the rear of the chute pen, opening the chute pen gate, counting the consignments of cattle as they move out of the pens, checking the count against the number recorded on the waybill, handing a copy of the waybill to the driver, and placing the waybill on the clerk's waybill box (fig. 8). Occasionally,

BN-6082

Figure 8.—A counter counting cattle out of a truck chute pen.

counters drive cattle from the chute to T-pens, and later dispatch the cattle from the T-pens.

This job is performed only on the second and third shifts for 5 days a week beginning at 3 p. m. on Sunday afternoon. One worker performs the job on each shift. The duties of the counter are absorbed by the checkers on the first shift and over the week-end. Counting is occasionally done on the first shift, but workers from other crews do the job. The 1955 labor used for counting amounted to 4,212 man-hours. The same amount of labor was expended on the second and third shifts—2,080 man-hours. Fifty-two man-hours of labor were used for checking on the first shift.

The time required for counting a consignment of cattle is usually less than 1 minute. No observations were noted where counters failed to keep abreast of the workload. A counter is included in the receiving crew to insure an accurate count and to prevent mix-ups. The counting job is confined primarily to the truck dock where consignments are larger and more subject to errors. Counters are not assigned to other jobs in the yards after the peak workloads have passed.

DRIVING includes driving consignments of cattle from the truck docks, trailer alley, or T-pens to holding pens (fig. 9). During the first shift employees of the commission firms

BN–6083

Figure 9.—A driver driving a large lot of cattle to a holding pen.

do the driving. Stockyards employees perform it on the second and third shift.

Stockyard employees take a copy of the waybill from the counter, drive cattle to the holding pens of the commission firm or packer to whom they are consigned, count the cattle into the pen, check the count against the number recorded on the waybill, close and lock the pen gate, record the pen number on the waybill, and deliver the waybill to the clerk's waybill box at the truck dock. Drivers on the second shift set block gates properly so animals cannot wander in the wrong direction. This is not necessary at the outset of the third shift. The size of the driving crew on the second and third shifts varies widely by days of the week. It ranges from about 15 workers on Sunday to as few as 2 on Friday and Saturday. Drivers work 8 hours a day. A lunch period is included in each worker's 8-hour day. Drivers are shifted frequently to other jobs in the yards.

In 1955, the total labor used by the stockyards for driving consignments of cattle amounted to 47,471 man-hours. The labor used varied considerably by shifts—16,097 man-hours were expended on the second shift, 31,233 man-hours on the third shift, and 81 man-hours on the first shift. The average labor used per consignment for driving on the second and third shifts was 0.70 man-hour (about 42 minutes). The labor used per consignment on the second shift was 0.40 man-hour and 1.30 man-hours on the third shift.

The driving job is related to the volume of consignments received. However, the amount of labor used weekly for driving varied less than 10 percent for the 4 weeks for which data were obtained, although the number of consignments varied about 70 percent.

A job analysis was made for a worker driving cattle on the second shift. This worker spent 71 percent of his time driving cattle, 7 percent for related work, and 22 percent waiting for cattle. During the observed period the worker made 18 drives averaging about 3,000 feet (distance to holding pens and back to the receiving docks). The average time per drive was 0.30 man-hour (18 minutes). The results of this job analysis indicate that the driving job on this shift is performed with a high degree of efficiency.

The amount of labor used by the stockyards for driving cattle on the second and third shifts was analyzed for a typical week, when 2,000 consignments were received. The average labor used per consignment on the second shift was 0.41 man-hour, 1.13 man-hours on the third shift. The labor used per consignment was lowest on both shifts on Monday—0.25 and 0.65 man-hour on the second and third shifts, respectively. The labor used per consignment on both shifts increased each successive day of the week until Saturday. More labor was used per consignment on Friday than on any other day of the week. The large amount of labor on Friday is because the workload is too light to keep one man fully occupied. Furthermore, labor for odd jobs is maintained at the truck docks—and if the jobs do not materialize the labor is charged to driving. The analysis of labor for the typical week indicates that more labor is available on the third shift than is required, and that labor on both shifts is not withdrawn as fast as the volume declines during the week.

Each commission firm has its own arrangement for driving cattle. Some firms have full time drivers, some have an arrangement for drivers who also drive for other firms, and some use their own yard labor for driving. Drivers are paid by the week, month, or on a consignment basis. Firms make frequent changes in their driving arrangements and with each change the arrangement may differ. Workers who devote full time for commission firms are classified as full-time drivers. Yard employees of commission firms and dealers who also drive are classified as part-time workers. In 1955, the labor used by commission firms for driving on the first shift was 29,485 man-hours—17,879 man-hours for workers who drove full time, and 11,606 man-hours for workers who drove part time. The average amount of labor used per consignment was 0.90 man-hour.

Drivers for commission firms occasionally combine consignments of cattle—particularly small consignments—for driving purposes, but most consignments are driven separately. The workload for driving on the first shift is at its peak between the hours of 7 a. m. and 10 a. m. After 10 a. m. the workload is so light that on most days 1 worker can usually perform the job for the remainder of the day. Full-time

workers employed by commission firms are idle most of the time after 10 a. m.

The total labor used in 1955 by the stockyards and commission firms for driving consignments of cattle amounted to 76,956 man-hours or about 0.8 man-hour per consignment.

Summary of present labor utilization

The total labor used for receiving cattle arriving by truck in 1955 amounted to 110,957 man-hours—an average of 1.1 man-hours for each consignment of cattle received. Of the total labor used, about 73 percent was expended by the stockyards and 27 percent by the commission firms.

Of the total labor used for receiving cattle into the market, 39 percent is expended in the third shift and 36 percent in the first shift, as compared with 25 percent on the second shift (table 3). The amount of labor used per consignment on the second shift is 0.6 man-hour as compared to 1.2 man-hours on the first shift and 1.8 man-hours on the third shift. The labor used per consignment on the second shift is 50 percent less than that used on the first shift and 67 percent less than that used on the third.

More labor is used for driving than for any other job in receiving cattle by truck. Sixty-nine percent of the total labor used was for driving. Sixty-two percent of the labor used for driving was expended by the stockyards and 38 percent by the commission firms. This is the only job for which the commission firms supply labor, and all of the labor is supplied on the first shift. Some commission firms have employees who do nothing but drive, and some use their yard employees to drive cattle. Twenty percent of the total labor is used for checking, 7 percent for clerking, and 4 percent for counting.

The average amount of labor used weekly by the stockyards and commission firms for receiving cattle amounted to 2,134 man-hours. Of this amount the stockyards supplied 1,567 man-hours and the commission firms 567 man-hours. The amount of labor used by the stockyards varies slightly by weeks, but not in the same proportion as the workload. The amount of labor used by commission firms is practically the same each week.

About 57 percent of the labor used by the stockyards for receiving cattle is used on Sunday, Monday, and Tuesday (about 19 percent each day), 16 percent on Wednesday, 13 percent on Thursday, 7 percent on Friday, and 7 percent on Saturday. The labor used by the commission firms is about the same each day.

Based on the average of 1.1 man-hours per consignment, 40 percent of the total labor used by the stockyards and commission firms for receiving cattle by truck is expended for receiving consignments containing from 1 to 3 cattle (fig. 10). The labor used per head of cattle for receiving consignments containing 1 to 3 cattle is 0.60 man-hour, as compared to the average for all size groups of 0.11 man-hour. The largest size group required only 0.03 man-hour per head.

TABLE 3.—*Receiving cattle by truck: 1955 labor utilization by the Stockyards and commission firms, by jobs and shifts*

Job	7 a.m. to 3 p.m.	3 p.m. to 11 p.m.	11 p.m. to 7 a.m.	Total
	Man-hours	*Man-hours*	*Man-hours*	*Man-hours*
Fort Worth Stockyards:				
Clerking	2,496	2,493	2,808	7,797
Checking	8,278	6,221	7,553	22,052
Counting	52	2,080	2,080	4,212
Driving	81	16,097	31,233	47,471
Subtotal	10,907	26,891	43,674	81,472
Commission firms:				
Full-time driving [1]	17,879	0	0	17,879
Part-time driving [2]	11,606	0	0	11,606
Subtotal	29,485	0	0	29,485
Total	40,392	26,891	43,674	110,957
Percent	36.4	24.2	39.4	100.0
Labor used per consignment	1.2	.6	1.8	1.1

[1] Driving by commission firm employees who do nothing but drive cattle.
[2] Driving by commission firm yard workers.

Facilities proposed

The area now used for trucks approaching and leaving the market should all be used for trucks approaching the market. Docks for loading out trucks should be moved to the south end of the yards. It is suggested that the approach area be paved. The dock for receiving cattle arriving by large trucks should remain intact in its present location. This dock permits a relatively high degree of efficiency in receiving cattle arriving by large trucks. It is suggested that the T-pens to the rear of the truck docks be renovated to provide more variable pen sizes, and a pen arrangement which would permit cattle to enter from one side of the pen and leave by the other. Forty-seven pens varying in size from 12 by 18 to 18 by 28 feet are suggested. This number of T-pens should provide adequate holding capacity for consignments of cattle arriving on peak volume days.

Two trailer alleys are proposed in the area now occupied by the dock for loading out cattle. Each would be about 12 feet wide and 110 feet long and would have a capacity for about four pickups or farm trailers at one time. Trailer alleys of this size should reduce the

BN–6084

Figure 10.—Driving small lots of cattle to sales pens is common.

time required for trucks to unload and drive from the alley. Twenty-five chute pens are proposed for the trailer alleys for holding consignments temporarily as they are unloaded. These pens would be used as T-pens when the workload warrants it. For the trailer alley, 81 T-pens are suggested. Most of the pens suggested are 10 by 12 feet—a few are 16 by 22 feet. These pens are more in line with the size of consignments received. The large number of T-pens is suggested so that small consignments of cattle can be held separately for a time, then driven in groups to holding pens.

It is proposed that new office space be provided for the clerk in a centrally located part of the cattle yards. Both buildings now located at the truck dock could be used as shelter houses for employees and truckers.

Holding pens used in receiving cattle arriving by truck are discussed under other facilities proposed. The arrangement of the truck dock, trailer alley, and T-pens is shown in figure 43. The average distance of the holding pens from the truck dock or trailer alleys with the proposed arrangement is about 600 feet or less than half the distance with facilities used in 1955.

Proposed operations and labor utilization

The proposed operations for receiving cattle by truck are similar to those already in operation. However, the facilities proposed should affect the operations materially. Therefore proposals are made for each job, and estimates are made of the amount of labor required to perform each job. The labor requirements are estimated for each day of a typical week when approximately 2,000 consignments and 20,000 cattle are received. This is about the same workload that the present labor force can handle and render a high standard of service.

CLERKING.—It is proposed that the four clerking jobs at the cattle and the hog and sheep truck and rail docks be combined into one clerking job to handle the work in connection with the receipt of livestock. Under this proposal one worker would perform the clerical work for each of the twenty-one 8-hour shifts in the week. Waybills would be delivered to the central clerical organization periodically by the foreman or a worker in the receiving crew. This clerical arrangement was observed in another terminal yard handling a comparable volume of business, and it appeared to handle the work in a highly satisfactory manner. The proposed clerical arrangement should be centrally located in the yards. An office could be prepared in a present hay barn for the clerical workers.

Table 80 in the Appendix shows a work schedule for these clerical workers, by shift and by day of week. The schedule provides for 24 man-hours daily, 168 man-hours weekly, and 8,736 man-hours annually. In 1955, the clerical work for all four jobs amounted to 20,640 man-hours. The proposed organization would reduce the 1955 labor for the four clerical jobs by 11,904 man-hours, or about 60 percent.

Total labor for the proposed central clerical organization is prorated among the four clerking jobs on the basis of the number of consignments or carload lots received and shipped. In 1955, 69 percent of the clerical workload was in connection with receiving cattle arriving by truck. Therefore, 69 percent of the cost of the suggested clerical labor, or 6,027 man-hours, would be charged to clerking for receiving cattle by truck.

CHECKING.—The proposed organization for checking cattle arriving by truck would be similar to that used in 1955. It is suggested, however, that since checkers are the stockyards' major contact with shippers, high standards be established for these workers. It also is proposed that the job of checking cattle received and shipped by rail be combined with the job of checking cattle arriving by truck. The job of checking cattle received and shipped by rail is sporadic—in 1955 only 943 man-hours were used in performing it.

Table 80 shows a work schedule for checking cattle arriving by truck, by shifts and by days of the week. The schedule provides for 338 man-hours weekly or 17,576 man-hours annually. It also provides for the charging of 8 hours for checking on each shift beginning at 3 p. m. on Friday and continuing until 3 p. m. on Sunday. At the present time only 4 hours on each shift during this period are charged

to checking. The number of workers provided for in the work schedule during peak business hours is about the same as the number used in 1955. The schedules suggest that workers be shifted promptly to other jobs when the workload declines to the point where they are no longer needed for checking cattle.

Only 16,633 man-hours of the total labor proposed should be charged to checking cattle arriving by trucks because 943 man-hours—227 on the first shift, 647 on the second shift, and 69 on the third shift—would be used for checking cattle received and shipped by rail. Of the 16,633 man-hours charged for checking cattle by truck, 4,764 man-hours are provided on the first shift, 5,905 man-hours on the second shift, and 5,963 man-hours on the third shift. The labor proposed for checking averages 0.16 man-hour per consignment. This is compared with 0.22 man-hour used in 1955.

COUNTING.—The proposed arrangement of the truck docks, trailer alley, and T-pens in relation to the holding pens would permit a free flow of cattle in several directions, and there would be less likelihood of mixups and miscounts. Consequently, the counting job may be abolished. This is in line with practices at some yards with similar facilities. Without this job, the 1955 labor for receiving cattle by truck would have been 4,212 man-hours fewer.

DRIVING.—Proposed methods for driving cattle from the truck dock and T-pens to holding pens are similar to those now employed, with the following exceptions: Consignments containing from 1 to 5 cattle would be yarded in T-pens after they are unloaded. Subsequently they would be marked, and driven in large groups to holding pens. It is estimated that combining small consignments for driving would reduce the workload for driving such consignments by 50 percent, and the total driving workload by 25 percent.

The suggested arrangement of holding pens in relation to the truck dock and trailer alley reduces the average distance of the drives from about 3,000 feet (round trip) to about 1,200 feet. Observations indicated that an average of 0.16 man-hour was required to drive cattle 1,200 feet (a round trip). It is estimated that workers could make about 35 drives during an 8-hour shift if they spent 70 percent of their time driving cattle. Some 30 percent of the driver's time could be devoted to other jobs in the yards, a lunch period, and waiting for consignments of cattle to arrive. Based on the assumption that the driving workload could be reduced 25 percent, that workers could make 35 drives during an 8-hour period, and that workers could take care of other periodic jobs, a work schedule for driving cattle provides for 576 man-hours weekly, or 29,952 man-hours annually (table 80).

The assumed work schedule provides for employees to drive cattle on all 3 shifts. This should not be construed as a recommendation that the stockyards employees should drive cattle on the first shift. Whether or not stockyards employees drive cattle on the first shift is a matter for the Fort Worth Stockyards management to decide. The provisions are made for comparative purposes only.

It is estimated that 1,711 man-hours of the annual driving labor supply would be used to perform sporadic jobs such as unloading, driving, and pen catching for cattle rail receipts and shipments. Some 827 man-hours of this labor would be required on the second shift, and 884 on the third shift. The total labor available for driving would be 28,241 man-hours. Of the total labor proposed for driving, 9,360 man-hours would be available on the first shift, 9,885 on the second shift, and 8,996 on the third shift. The labor proposed for driving averages 0.28 man-hour per consignment, compared with 0.75 man-hour used in 1955.

Summary of proposed utilization of labor

The total labor proposed for receiving cattle arriving by trucks is 50,901 man-hours, an average of 0.50 man-hour per consignment.

Thirty-two percent of the labor proposed for receiving cattle would be used on the first shift, 35 percent on the second shift, and 33 percent on the third shift. The labor proposed per consignment is 0.45 man-hour for the first shift, 0.41 man-hour for the second shift, and 0.69 man-hour for the third shift (table 4).

More labor is proposed for driving than any other job. Fifty-five percent of the total labor proposed for receiving cattle would be used for driving cattle. For the purpose of this analysis the total labor proposed for driving would be provided by the Fort Worth Stockyards. Twelve percent of the labor supply for receiving cattle by truck is proposed for clerking and 33 percent for checking. No labor is proposed for counting because it is suggested that the job be abolished.

The average amount of labor proposed weekly for receiving cattle arriving by truck is 979 man-hours. This amount should vary considerably, however, because the general arrangement of the proposed facilities provides the flexibility needed for shifting workers promptly to other jobs as the workload declines.

About 36 percent of the labor propose l would be used on Monday and Tuesday (about 18 percent each day), 16 percent on Wednesday, 14 percent on Thursday, 10 percent on Friday, 9 percent on Saturday, and 15 percent on Sunday.

Based on the average estimated labor requirement of 0.50 man-hour per consignment, 40 percent of the proposed labor would be used for receiving consignments containing 1 to 3 cattle. The labor proposed per head for re-

ceiving consignments containing 1 to 3 cattle is 0.27 man-hour, as compared with the average for all size groups of 0.05 man-hour. The largest size group required only 0.01 man-hour per head.

TABLE 4.—*Receiving cattle by truck: Proposed labor utilization, by jobs and shifts*

Job	7 a.m. to 3 p.m.	3 p.m. to 11 p.m.	11 p.m. to 7 a.m.	Total
	Man-hours	*Man-hours*	*Man-hours*	*Man-hours*
Clerking	2,009	2,009	2,009	6,027
Checking	4,765	5,905	5,963	16,633
Counting	0	0	0	0
Driving	9,360	9,885	8,996	28,241
Total	16,134	17,799	16,968	50,901
Percent	31.7	35.0	33.3	100.0
Labor per consignment	.45	.41	.69	.50

Comparison of present and proposed labor utilization

The estimated labor required of the Fort Worth Stockyards for receiving cattle with the proposed facilities and operations amounts to 50,901 man-hours. This labor is 30,571 man-hours less than the stockyards used in 1955, and in 1955 the stockyards did not provide the labor for driving cattle on the first shift. If the commission firms continue to drive cattle on the first shift, only 41,767 man-hours would be required of the stockyards for receiving cattle.

The estimated amount of labor required per consignment for receiving cattle arriving by trucks with the proposed facilities and operations is 0.5 man-hour, as compared with 1.1 man-hours used in 1955 (table 5). The estimated labor required per head is 0.05 man-hour; in 1955, 0.55 man-hour. The labor used per head of cattle for receiving consignments containing 1 to 3 head was reduced from 0.60 man-hour to 0.27 man-hour with the proposed facilities and organization. The largest size group required 0.03 man-hour in the 1955 market and only 0.01 man-hour per head in the proposed market. The amount of labor proposed by shifts is better adjusted to the workload than the amount of labor used in 1955.

The labor proposed for clerking is 1,770 man-hours less than the amount used in 1955. The reduction would be made possible by the use of a central clerical system. The proposed labor for checking is 25 percent (5,419 man-hours) less than that used in 1955. This reduction is made possible by greater flexibility in use of market facilities. The arrangement of facilities to provide a free flow of cattle from the truck docks to the holding pens should make the counting job unnecessary, thereby saving 4,212 man-hours. The proposed labor for driving is 19,170 man-hours less than the stockyards used for driving in 1955. The reduction in labor is made possible by combining small consignments, and shorter distances due to compact arrangement of facilities.

The total labor used by the stockyards for receiving cattle arriving by trucks would be less on the second and third shifts than in 1955. The amount of labor required of the stockyards would be greater on the first shift if the stockyards workers drive cattle to holding pens. The estimated labor required for driving on the first shift amounts to 9,360 man-hours; however, a reduction in the amount of labor needed for clerking, checking, and counting operations would effect a net increase

TABLE 5.—*Receiving cattle by trucks: Comparison of present and proposed utilization of labor for Fort Worth Stockyards, by jobs and shifts*

Job	7 a.m. to 3 p.m.	3 p.m. to 11 p.m.	11 p.m. to 7 a.m.	Total
	Man-hours	*Man-hours*	*Man-hours*	*Man-hours*
Present facilities and operations:				
Clerking	2,496	2,493	2,808	7,797
Checking	8,278	6,221	7,553	22,952
Counting	52	2,080	2,080	4,212
Driving	81	16,097	31,233	47,411
Total	10,907	26,891	43,674	81,472
Labor per consignment	[1] 1.18	.62	1.77	[1] 1.08
Labor per head	[1] .19	.06	.13	[1] .11
Proposed facilities and operations:				
Clerking	2,009	2,009	2,009	6,027
Checking	4,765	5,905	5,963	16,633
Counting	0	0	0	0
Driving	9,360	9,885	8,996	28,241
Total	16,134	17,799	16,968	50,901
Labor per consignment	.47	.40	.69	.50
Labor per head	.08	.04	.07	.05
Benefits with proposed facilities and operations:				
Clerking	487	484	799	1,770
Checking	3,513	316	1,590	5,419
Counting	52	2,080	2,080	4,212
Driving	−9,279	6,212	22,237	19,170
Total	−5,227	9,092	26,706	30,571
Labor per consignment	.71	.22	1.08	.58
Labor per head	.11	.02	.06	.06

[1] Includes the labor used by commission firms for driving cattle.

in labor of only 5,227 man-hours. The labor suggested for receiving cattle by truck with proposed facilities and operations is less than that used in 1955 (table 6). The greatest reduction is on Sunday and the smallest on Friday. The average daily reduction in labor amounts to about 37 percent. The average daily amount of labor used by the stockyards in 1955 was 224 man-hours, as compared with 140 man-hours suggested with improved facilities and operations.

TABLE 6.—*Receiving cattle by trucks: Comparison of present and proposed labor utilization by day of the week*

Day	Labor used with present facilities and operations	Labor suggested with proposed facilities and operations	Estimated benefits from proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	15,717	8,959	6,758	42.7
Tuesday	15,395	8,959	6,436	41.5
Wednesday	13,072	8,246	4,826	36.6
Thursday	10,962	7,126	3,836	34.6
Friday	5,399	4,988	411	7.1
Saturday	5,567	4,530	1,037	18.2
Sunday	15,360	8,093	7,267	47.0
Total	81,472	50,901	30,571	37.2

Receiving and Shipping Cattle by Rail

Present facilities

The same facilities are used for both receiving and shipping cattle by rail. These facilities consist of a rail dock with 47 chute pens, 81 shipping pens, and a rail dock office. The rail dock is a concrete structure about 2,210 feet long, and the platform of the dock is 10 feet deep. The 47 chute pens with the dock are about 20 by 40 feet. These pens are of proper size for carload lots of cattle. The 81 shipping pens range in size from 20 by 28 feet to 32 by 55 feet, with a pen space area of 103,539 square feet. These pens are adequate for carload lots, but they are too large for yarding bulls. The rail dock office is a substantial two-story structure about 20 by 52 feet. It is located in the center of the rail dock and provides excellent office space for the rail dock clerk and shelter for yard workers.

The rail facilities generally permit efficient handling in receiving and shipping cattle by rail. However, the facilities are excessive for the present rail business.

Holding and shipping pens are used for yarding cattle after they are received or prior to being shipped. The average distance of these pens from the rail dock is about 600 feet.

Receiving and shipping workload

The operations performed in receiving cattle arriving by rail and shipping cattle by rail generally are similar, and in many instances the same workers receive and ship cattle by rail. Thus, the workload for receiving cattle and shipping cattle by rail is discussed jointly. The time and labor required to receive or ship a car of calves or cattle is about the same. Therefore, the workload for receiving or shipping cattle by rail is determined by the number of cars rather than the number of cattle.

In 1955, 5,839 rail cars with 223,187 cattle were received at the market or shipped from it. Of the total of 1,561 cars with 52,062 cattle received, 58 percent of the cars were received on the first shift, 28 percent on the second shift, and 14 percent on the third shift. A total of 4,278 cars with 171,125 cattle were shipped from the market by rail. Fourteen percent of these cars were shipped on the first shift, 81 percent on the second shift, and 5 percent on the third. Sixty-nine percent of the total workload for receiving and shipping cattle by rail occurs on the second shift, 24 percent on the first shift, and 7 percent on the third shift.

An average of 16 rail cars was received or shipped each day of the year. Wide departures from the averages are common. Generally, rail receipts and shipments are concentrated on the first 4 days of the week, but they may occur on any day (table 7). Furthermore, as they may occur at any hour of the day, labor must be available at all times to handle rail receipts and shipments.

Operations and labor utilization

In receiving cattle arriving by rail the gates of the chute pens are unlocked, opened, and affixed to the rail car. A portable bridge is laid between the floor of the rail car and the platform, the car door opened, and the cattle driven from the car into the chute pen. The gate to the chute pen is closed and locked and the portable bridge removed. The "out" gate of the chute pen is opened, and as cattle are driven out of the pen they are counted. The cattle are then driven to holding or shipping pens in the yard where they are again counted, and the gate to the pen is closed and locked. These operations are reversed in shipping out cattle by rail.

Information as to the number of the car, number of cattle in the carlot, the consignor, and the consignee, is obtained for both cattle received and shipped.

The jobs performed in receiving and shipping cattle by rail are (1) clerking, (2) checking, (3) unloading and loading, (4) counting, (5) driving, (6) pen catching, and (7) bedding cars. Labor is charged for awaiting orders in connection with receiving and ship-

TABLE 7.—*Receiving and shipping cattle by rail: Cars of cattle received and shipped, by day of week*

Day	Rail cars		Cattle	
	Number	*Percent*	*Number*	*Percent*
Rail cars and cattle received:				
Monday	206	3.5	7,080	3.2
Tuesday	162	2.8	6,508	2.9
Wednesday	353	6.1	11,661	5.2
Thursday	265	4.5	8,226	3.7
Friday	103	1.8	4,114	1.8
Saturday	177	3.0	5,623	2.5
Sunday	295	5.1	8,850	4.0
Subtotal	1,561	26.8	52,062	23.3
Rail cars of cattle shipped:				
Monday	804	13.8	31,316	14.0
Tuesday	872	14.9	36,963	16.6
Wednesday	1,108	18.9	39,359	17.7
Thursday	1,040	17.9	40,214	18.0
Friday	368	6.3	19,337	8.7
Saturday	0	0	0	0
Sunday	86	1.4	3,936	1.7
Subtotal	4,278	73.2	171,125	76.7
Total rail cars and cattle:				
Monday	1,010	17.3	38,396	17.2
Tuesday	1,034	17.7	43,471	19.5
Wednesday	1,461	25.0	51,020	22.9
Thursday	1,305	22.4	48,440	21.7
Friday	471	8.1	23,451	10.5
Saturday	177	3.0	5,623	2.5
Sunday	381	6.5	12,786	5.7
Total	5,839	100.0	223,187	100.0

ping cattle by rail, and for the purposes of this analysis awaiting orders is classified as a job. The work day for receiving and shipping cattle by rail is divided into the same three standard shifts as the work day for receiving cattle by truck. Clerking and checking jobs on some shifts are separate jobs and on others are combined. Most other jobs are performed by workers assembled from other crews, as they are needed.

CLERKING.—The clerking job is performed 24 hours a day every day. The work day is divided into the three standard shifts. One worker is on duty each shift. The workers on the first and second shifts, Monday through Friday, devote full time to the clerking job. On all other shifts during the week the duties of clerking and checking are combined, and one worker performs both jobs. The rail clerk is responsible for all clerical duties in receiving and shipping cattle by rail, and the checker is responsible for checking all cattle received and shipped by rail. In 1955, the total labor used for clerking in receiving and shipping cattle by rail amounted to 6,035 man-hours, or about 1.03 man-hours for each rail car of cattle received or shipped.

Observations of clerking on the second shift indicate that clerks at the rail dock have little work. It is estimated that the time required for clerking duties would average only about 30 minutes per 8-hour shift.

CHECKING.—Checking at the cattle rail dock is performed 24 hours every day, but workers are assigned to the job only on the first and second shifts, Monday through Friday. On other shifts checking and clerking are combined, and one worker does both jobs. In addition to doing all the checking for rail receipts and shipments, checkers on the second and third shifts, and on all shifts over the weekend, weigh a few consignments of cattle arriving by rail or truck. Occasionally, the checkers may assist either with unloading, pen catching, counting, or driving, and sometimes they are assigned to other jobs. The time devoted to each job is charged to that particular job. The total labor used for checking in 1955 amounted to 943 man-hours, or about 0.16 man-hour per rail car of cattle received or shipped.

A job analysis was made of a checker on duty for 8 hours on the second shift. He was engaged in productive work 24 percent of the time and idle 76 percent. During the 8-hour period, 14 cars of cattle were loaded out—an unusually heavy workload. The workload for the checker is light.

UNLOADING, LOADING, COUNTING, DRIVING, AND PEN CATCHING. — The jobs of unloading, loading, counting, driving, and pen catching are discussed as a unit because they are interrelated. Generally, the crew for these jobs in receiving or shipping cattle consists of 4 workers, and occasionally of only 2 or 3 workers. Usually the crew is assembled from other crews in the yard. From Monday through Friday, however, four workers report to the rail dock at 3 p. m. to perform jobs either in receiving or shipping cattle (fig. 11). The total labor used for unloading, counting, driving, and pen catching amounted to 3,766 man-hours in 1955 —or an average of about 0.66 man-hour per rail car of cattle received or shipped.

Observations noted of workers unloading, loading, counting, driving, and pen catching indicate that these jobs are performed with a high degree of efficiency.

BEDDING CARS.—Cars are usually bedded by the same workers who receive or load out cattle by rail. Most cars are bedded a considerable time before loading (fig. 12). In 1955, the total labor used for bedding cars amounted to 575 man-hours. Not all rail cars were bedded.

AWAITING ORDERS.—A crew of workers report to the rail dock Monday through Friday each week, regardless of whether there are cars to be received or shipped. In the event there is no work to be performed immediately,

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Figure 11.—Loading a rail car with cattle with a four-man crew.

they wait at the dock until they are given orders.

The time these workers wait at the rail dock is classified as awaiting orders. In 1955, a total of 2,707 man-hours were charged to awaiting orders—approximately .047 man-hour for each car of cattle received or shipped. The labor used for awaiting orders would be eliminated by assembling the crew for receiving and shipping cattle by rail only when they are needed. In 1955 the crew was assembled when needed on the first and third shifts.

BN–6086

Figure 12.—Hay stacked on the rail dock for bedding cars.

Summary of labor utilization

The total labor used for receiving and shipping 5,839 rail cars of cattle in 1955 amounted to 14,026 man-hours. The average labor used per car amounted to 2.4 man-hours. The labor used by jobs in receiving and shipping cattle by rail is shown in table 8.

TABLE 8.—*Receiving and shipping cattle by rail: Labor used by jobs*

Type of job	Labo	
	Man-hours	*Percent*
Clerking	6,035	43.0
Checking	943	6.7
Unloading and loading	1,898	13.5
Counting	669	4.8
Driving	1,115	8.0
Pen catching	84	.6
Bedding cars	575	4.1
Awaiting orders	2,707	19.3
Total	14,026	100.0

More labor (43 percent) was used for clerking than for any other job in the receiving and shipping of cattle by rail. Seven percent of the labor was used for checking; 27 percent for unloading and loading, counting, driving, and pen catching; 4 percent for bedding cars; and 19 percent for awaiting orders.

The amount of labor used by days of the week for receiving and shipping cattle varies widely. Generally, the labor used is the same for the first 4 days of the week (about 18.5 percent each day), 11 percent is used on Friday, 8 percent on Saturday, and 7 percent on Sunday.

Proposed facilities

The present rail dock and chute pens are excellent structures for handling rail receipts and shipments. Although the dock and chute pens are excessive for current rail business, about half of the chute pens could be used as utility pens if the occasion demanded it. Continued use of the dock and 43 chute pens is proposed. It is proposed that four chute pens and the adjacent dock be razed to provide space for new hay barns.

It is suggested that the shipping pens be relocated in the southeast section of the cattle division and that rail receiving and shipping be done at the south end of the rail dock. Eighty-six shipping pens are proposed. Thirty of the pens would be 10 by 14 feet for holding bulls before shipping from the market. The other 56 pens would range from 20 by 20 feet to 24 by 40 feet and would handle carload lots of cattle.

The average distance of the holding and ship-

ping pens from the rail dock would be about 600 feet.

The new clerking organization already outlined calls for the abandonment of the rail dock office. It is suggested that this structure be used for storing supplies and materials.

Proposed operations and labor utilization

The proposed operations are practically the same as the ones now employed, and the jobs suggested also are the same. However, the amount of labor is materially affected. The labor estimates for the specific jobs are based on the same volume as was handled in 1955.

CLERKING.—The proposed central clerking organization has previously been described. Some 3 percent of the total cost of the central organization should be charged to receiving and shipping by rail. Based on this criterion, the estimated amount of labor which would be required for clerking is about 0.04 man-hour per car.

CHECKING.—Most jobs by checkers at the cattle rail dock are periodic and usually of short duration. It is therefore suggested that the duties of the checkers at the rail docks be combined with those at the truck docks. Adequate labor was provided in the work schedules for checking cattle arriving by trucks as well as by rail. When both jobs need to be done at the same time, it is suggested that provision be made for other workers to perform one of the checking jobs. This system is being used now to some extent.

Although some reduction in the 1955 labor used for checking at the cattle rail dock should result from this proposal, no reduction in labor is calculated because of the nature of the job and the small amount of labor involved. Estimated labor for checking duties with the proposed facilities and methods is 943 man-hours.

UNLOADING, LOADING, COUNTING, DRIVING, AND PEN CATCHING.—As previously stated, the jobs of unloading, loading, counting, driving, and pen catching in receiving and shipping cattle by rail are performed with a high degree of efficiency, and it is estimated that the same amount of labor used for these jobs in 1955—3,765 man-hours—would be used with the proposed facilities for the same volume. The work schedule proposed for driving cattle from the truck docks to holding pens and feeding cattle, together with the proposed labor pool, provides adequate labor for loading, unloading, driving, and pen catching at the cattle rail dock (table 80). It is estimated that 907 man-hours would be required to perform these jobs on the first shift, 2,582 man-hours on the second shift, and 276 man-hours on the third.

BEDDING CARS.—Rail cars would be bedded with the proposed facilities as at present. It is estimated that the amount of labor used—575 man-hours—would be the same. Provisions for bedding labor are made in the assumed work schedules (table 80).

AWAITING ORDERS.—The present practice of having a crew report to the cattle rail dock at 3 p. m., Monday through Friday, to unload, load, count, drive, pen catch, and wait for orders, should be discontinued. Workers for these jobs can be assembled from other crews as they are needed, as is done in many cases now. This proposal should eliminate the labor charged to awaiting orders. This would reduce the total cost of receiving and shipping cattle by rail by 2,707 man-hours.

Summary of proposed labor utilization

The total labor estimated for receiving and shipping cattle by rail with improved facilities and operations is 5,545 man-hours—an average of 0.95 man-hour per car.

Approximately 68 percent of the labor proposed is for unloading and loading, counting, driving, and pen catching; 5 percent for clerking; 17 percent for checking, and 10 percent for bedding cars (table 9). The labor proposed would vary widely by days of the week.

Twenty percent of the labor is proposed for Monday, 21 percent for Tuesday, 24 percent for Wednesday, 21 percent for Thursday, 6 percent for Friday, 4 percent for Saturday, and 4 percent for Sunday.

TABLE 9.—*Receiving and shipping cattle by rail: Proposed labor utilization, by jobs*

Type of job	Labor	
	Man-hours	*Percent*
Clerking	261	4.7
Checking	943	17.0
Unloading and loading	1,898	34.2
Counting	667	12.1
Driving	1,115	20.1
Pen catching	84	1.5
Bedding cars	575	10.4
Total	5,545	100.0

Comparison of present and proposed labor utilization

The labor proposed for receiving and shipping cattle by rail with improved facilities and operations is 5,545 man-hours, as compared with 14,026 used in 1955. This reduction of 8,481 man-hours is about 61 percent. The labor proposed per car amounts to 0.95 man-hour, as compared with 2.4 man-hours used in 1955.

The labor proposed for all jobs is the same as that used in 1955, except the clerking and awaiting orders jobs (table 10). The proposed

central clerking organization should reduce the 1955 clerking labor by 5,774 man-hours. All the labor used in waiting for orders—2,707 man-hours—should be eliminated.

TABLE 10.—*Receiving and shipping cattle by rail: Comparison of present and proposed utilization of labor by jobs*

Job	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations
	Man-hours	*Man-hours*	*Man-hours*
Clerking	6,035	261	5,774
Checking	943	943	0
Unloading and loading	1,898	1,898	0
Counting	669	669	0
Driving	1,115	1,115	0
Pen catching	84	84	0
Bedding cars	575	575	0
Awaiting orders	2,707	0	2,707
Total	14,026	5,545	8,481

The labor proposed for receiving and shipping cattle by rail with improved facilities and operations is less for each day in the week than that used with 1955 facilities and operations (table 11). The average daily reductions in labor amount to 1,211 man-hours.

TABLE 11.—*Receiving and shipping cattle by rail: Comparison of present and proposed labor utilization by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	2,483	1,123	1,360	54.8
Tuesday	2,607	1,141	1,466	56.2
Wednesday	2,707	1,313	1,394	51.5
Thursday	2,656	1,167	1,489	56.1
Friday	1,570	339	1,231	78.4
Saturday	1,138	233	905	79.5
Sunday	865	229	636	73.9
Total	14,026	5,545	8,481	60.5

Weighing Cattle

Present facilities

Nine scale blocks, widely scattered throughout the cattle division, are used for weighing cattle. Each is composed of the scale pocket and platform, house, and catch pens. The arrangement of the scale blocks in relation to sales pens necessitates the opening of practically all scale blocks every day, regardless of the volume, to render adequate weighing service.

The scale pocket is the alley in front of the scale platform. It is used to hold and sort cattle before they are driven onto the platform. Only one lot of cattle can be sorted at a time. The pocket is inadequate for continuous sorting and weighing.

Present scale platforms vary in size. Seven are 14 by 26 feet, one 12 by 28 feet, and one 14 by 48 feet. These platforms are too large for efficiently weighing small drafts. Five of the scales have a weighing capacity of 20,000 pounds and 4 have a capacity of 40,000 pounds. The scale houses are durable structures that range in size from 10 by 20 feet to 18 by 50 feet (fig. 13). Each contains an enclosed space for the weighbeam and working area for the weighmaster. The rest of the house is used as a public waiting room and passageway. Scale house roofs extend over and provide cover for the scale platform. The scale houses are larger than they need to be.

BN-6067

Figure 13.—A typical scale house on the Fort Worth Stockyards.

Catch pens hold cattle after they are weighed and until delivered to the purchaser. Cattle are frequently held until after the market closes in the afternoon and are sometimes held overnight. Catch pens range in size from 10 by 10 feet to 30 by 50 feet. The number of catch pens and the size of pens within the individual scale blocks vary widely. All nine blocks have a total of 607 catch pens that provide 157,467 square feet of space. Most of the catch pens are too small or too large to permit the most efficient utilization of space. The capacity of the catch pen area is estimated at 4,000 cattle, or an average of about 40 square feet per head. Many catch pens are too far from the scale platform and are not well arranged.

Weighing workload

Cattle are driven to the scale block and sorted into various size lots, and each lot is driven onto the scale platform and weighed. The weighing of a lot of cattle is called weighing a draft of cattle. The time and labor required to weigh a large draft is not much greater than that required to weigh a small one. Therefore, the weighing workload is determined by the number of drafts weighed rather than the number of cattle. In addition to weighing cattle, transfer and dollar tickets are prepared. Transfer tickets are scale tickets on which weights of previously weighed animals are transferred. Dollar tickets are prepared for animals sold by the head. The time required to prepare these tickets is about the same as that required to weigh a draft of animals.

Most of the cattle are weighed between 8:30 a. m. and 5 p. m., Monday through Friday. Direct cattle are weighed as they arrive on the market. This means that direct cattle may be weighed at any hour, day or night, any day of the week.

In 1955, a total of 285,540 drafts, transfer tickets, and dollar tickets, involving 1,032,065 cattle, were made on the market. The number of drafts weighed was 274,776 and involved 890,053 cattle. A total of 9,360 transfer tickets and 1,404 dollar tickets were prepared, involving 142,012 cattle.

The cattle weighing workload is divided into weighing market and dealer cattle. Market cattle are weighed at eight scale blocks and dealer cattle are weighed at one scale block. Transfer and dollar tickets are prepared only at the scale block for dealer cattle. Direct cattle weighed between 8:30 a. m. and 5 p. m. Monday through Friday are considered part of the market cattle weighing workload. Direct cattle weighed at night and on Saturday and Sunday are not considered part of the weighing workload.

MARKET CATTLE WEIGHING WORKLOAD.—The largest number of drafts are weighed on Monday (table 12); 88 percent of the workload is weighed on Monday, Tuesday, and Wednesday. The workload drops sharply on Thursday, and Friday accounts for only 2 percent of the total workload.

DEALER CATTLE WEIGHING WORKLOAD.—During 1955, 16,380 drafts, with 109,096 cattle, were weighed for dealers (table 13). The largest number of drafts of dealer cattle are weighed on Tuesday. Monday, Tuesday, and Wednesday account for about 78 percent of the total dealer cattle weighing workload. The weighing workload drops sharply on Thursday, and Friday accounts for only 6 percent of the workload.

In addition to weighing drafts of dealer cattle at the block designated for weighing such cattle, transfer and dollar tickets are also prepared at this scale block. Table 14 shows the number of transfer and dollar tickets prepared, by day of week.

TABLE 12.—*Weighing market cattle: Drafts weighed, by day of week*

Day	Drafts		Cattle	
	Number	*Percent*	*Number*	*Percent*
Monday	87,763	34.0	272,894	34.9
Tuesday	78,286	30.2	214,541	27.6
Wednesday	60,861	23.6	180,719	23.1
Thursday	26,169	10.1	85,230	10.9
Friday	5,317	2.1	27,573	3.5
Total	258,396	100.0	780,957	100.0

TABLE 13.—*Weighing dealer cattle: Drafts weighed, by day of the week*

Day	Drafts		Cattle	
	Number	*Percent*	*Number*	*Percent*
Monday	4,056	24.8	24,804	22.7
Tuesday	4,836	29.5	34,632	31.7
Wednesday	3,796	23.2	22,724	20.9
Thursday	2,704	16.5	18,096	16.6
Friday	988	6.0	8,840	8.1
Total	16,380	100.0	109,096	100.0

TABLE 14.—*Weighing cattle: Transfer and dollar tickets prepared by day of week*

Day	Transfer tickets		Dollar tickets		Total	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Monday	2,444	26.1	312	22.2	2,756	25.6
Tuesday	2,444	26.1	468	33.4	2,912	27.1
Wednesday	3,068	32.8	260	18.5	3,328	30.9
Thursday	1,144	12.2	260	18.5	1,404	13.0
Friday	260	2.8	104	7.4	364	3.4
Total	9,360	100.0	1,404	100.0	10,764	100.0

Operations and labor utilization

Five jobs are performed in weighing cattle—backgating, weighmastering, counting, driving, and pen catching. Backgating involves driving cattle from the scale platform and opening and closing the "on" gate of the scale platform as cattle are driven onto it (fig. 14). Weighmastering consists of making weight determinations and recordings (fig. 15). Counting includes opening the "off" gate of the scale platform, counting the cattle as they are driven from the scale platform, and recording the operation (fig. 16). Driving consists of driving cattle to catch pens. Pen catching includes un-

locking gates to catch pens, counting the animals into the pens, locking the gates, and making proper recordings (fig. 17). One worker is usually responsible for performing each job. However, two workers are sometimes used for driving. The jobs are interrelated and are

BN–6058

Figure 14.—A backgateman closing the scale gate as a lot of cattle are being driven onto the scale platform.

performed as a unit at each scale block in weighing drafts of cattle. The same jobs are performed in weighing market cattle and dealer cattle. The analysis of the weighing cattle operations is made on the basis of weighing market cattle and weighing dealer cattle. The method and labor used for weighing direct cattle arriving on the market at night, on Saturday, and on Sunday is presented on the basis of weighing direct cattle.

BN–6089

Figure 15.—A weighmaster making a weight determination at the Fort Worth Stockyards.

BN–6090

Figure 16.—A counter opening the scale gate and counting.

WEIGHING MARKET CATTLE.—The selling period on the market for commission firms is from 8 a. m. to 3 p. m., Monday through Friday, and weighing hours for their cattle are from 8:30 a. m. to 4:15 p. m. on the same days. The later opening period allows for a

BN–6091

Figure 17.—A driver and pen catcher yarding a lot of cattle in a scale block catch pen at the Fort Worth Stockyards.

backlog of cattle to develop for weighing. The later closing period allows time to weigh all animals sold. When the volume of business

is unusually heavy, the scale block may remain open after 4:15 p. m. When business is light, scale blocks may close early. Toward the end of the week when the volume is small, one or more scale blocks may not open. When all eight scale blocks are open the total crew for weighing consists of about 40 workers. They are shifted to other jobs when scale blocks are closed.

Commission firms are assigned specific scale blocks. From 1 to 5 firms weigh at a scale block. Commission firms are assigned specific time periods for weighing, usually at half-hour intervals. If a firm is not prepared to weigh in its assigned period, the time is given to a firm assigned to the scale block that is prepared to weigh. If no firm assigned to the scale block is prepared to weigh, the scale is idle.

Monday through Thursday practically all the scale blocks for weighing market cattle are open (table 15). The number of scale blocks opened each day is largely determined by the arrangement of facilities rather than the size of the workload. For illustration, an average of 6¼ scale blocks are open on Friday for a total of 10 hours, and 88 man-hours of labor are used to weigh 102 drafts of cattle. One scale block accessible to all commission firms should easily weigh the 102 drafts in a 4-hour period with 20 man-hours of labor. Thus, the present arrangement necessitates the use of more than 4 times the required labor. In a lesser degree, the same is true for the other days of the week. Furthermore, workers who start the day weighing cattle cannot begin other jobs at the same time. Consequently, the total labor load of the market is increased.

An average of 31 drafts are weighed per hour of scale block open time. Studies show that the scale blocks are operating only 66 percent of the time they are open—and that market cattle are weighed at an average rate of 46 drafts per hour. An average weighing rate of 31 drafts per hour for scale block open time is extremely low when compared to 55 or 60 drafts per hour obtained in terminal yards with properly arranged scale blocks. It is extremely low when compared with the current rate of 46 drafts per hour of scale block operating time.

The average amount of labor used per draft in 1955 was 0.21 man-hour. However, the average amount used daily varied from 0.18 man-hour on Tuesday and Wednesday to 0.86 man-hour on Friday.

In 1955, the labor used for weighing market cattle totaled 53,024 man-hours. Of the total labor used, 12,422 man-hours, or 23.4 percent, was for weighmastering; 8,356 man-hours, or 15.7 percent, was for backgating; 10,108 man-hours, or 19.1 percent, was for counting; 12,025 or 22.7 percent, was for driving; and 10,113 man-hours, or 19.1 percent, was for pen catching. The differences in the amount of labor used for performing specific jobs are primarily due to differences in the time individual workers are shifted to other jobs when weighing is completed.

The amount of labor used for weighing market cattle varies widely by days of the week. Of the total labor used, 31 percent is used on Monday, 27 percent on Tuesday, 21 percent on Wednesday, 12 percent on Thursday, and 9 percent on Friday. The daily variation is caused by the labor load being constantly adjusted, insofar as practical, to a declining workload.

The widely scattered scale blocks necessitate the use of more labor for weighing market cattle. Less labor would be required if the scale blocks were properly grouped and arranged in the market proper so that each was accessible to all commission firms. Any major realinement in the present weighing organization to effect a saving of labor would be difficult to accomplish. In fact, any changes that might be made in the present organization with present facilities would probably be offset by an increase in the amount of weighing labor used by commission firms.

WEIGHING DEALER CATTLE.—The scale block for weighing dealer cattle is open from 9 a. m.

TABLE 15.—*Weighing market cattle: Daily average number of scale blocks open, hours scale blocks open, drafts weighed, labor used, drafts weighed per hour, and labor used per draft weighed*

Day	Scale blocks open	Hours scale blocks open	Drafts weighed	Labor used	Drafts weighed per hour	Labor used per draft weighed
	Number	*Number*	*Number*	*Man-hours*	*Number*	*Man-hours*
Monday	7.75	53	1,687	313	32	0.19
Tuesday	8.00	43	1,505	274	35	.18
Wednesday	8.00	34	1,170	217	34	.18
Thursday	7.50	20	505	128	25	.25
Friday	6.25	10	102	88	10	.86
Total or average		160	4,969	1,020	31	.21

to 5 p. m., Monday through Friday, regardless of the workload. The scale crew for weighing dealer cattle consists of 6 workers—2 for driving, and 1 for each of the other 4 jobs.

Transfer and dollar tickets also are prepared at the scale block for weighing dealer cattle. These jobs are clerical and the weighmaster at the scale block performs both. Other workers in the crew are idle while he prepares tickets. The number of tickets prepared averages only about five per hour, and the job is not time consuming. It could easily be absorbed by a clerk in the stockyards general office.

The average number of drafts weighed per hour at the scale is 7.9—varying from a high of 11.6 on Tuesday to a low of 2.4 on Friday (table 16). The scale block operates with a full crew practically all the time. The amount of labor used each day is relatively constant. The amount of labor used per draft weighed averages 0.82 man-hour—varying from a low of 0.59 man-hour on Tuesday to a high of 2.42 man-hours on Friday.

The average amount of labor used per draft for weighing dealer cattle is more than four times the amount used for market cattle. The average number of drafts weighed per hour at the dealer scale block is only 20 percent of the drafts for weighing market cattle. The difference in labor would appear to warrant the abolishment of a separate scale block for weighing dealer cattle.

The total amount of labor used for weighing dealer cattle and preparing transfer and dollar tickets in 1955 was 13,487 man-hours. Of the total amount of labor used, 2,493 man-hours, or 18.5 percent, was for weighmastering; 2,083 man-hours, or 15.5 percent, for backgating; 2,109 man-hours, or 15.6 percent, for counting; 4,427 man-hours, or 32.8 percent, for driving; and 2,375 man-hours, or 17.6 percent, for pen catching. The labor used for driving is out of proportion because two drivers are customarily used at the dealer scale block.

Because the scale block remains open from 9 a. m. to 5 p. m. Monday through Friday, the amount of labor used, by days of the week, is relatively constant.

It would be difficult to discontinue the dealer scale and render reasonable service to dealers because of the manner in which the scale blocks for weighing market cattle are scattered. A scale arrangement which would allow any commission firm or dealer ready access to all scale blocks should allow the dealer scale to be abolished.

WEIGHING DIRECT CATTLE.—The weighing of direct cattle pertains only to direct cattle arriving on the market at night and on Saturday and Sunday. The checker or combination clerk-checker at the rail dock, who is a licensed weighmaster, makes the weight determination and recordings for each draft. The time the worker devotes to making weight determinations and recordings is charged to weighmastering. In 1955, a total of 1,869 man-hours was charged to the job of weighmastering. The labor used for such jobs as backgating, counting, driving, and pen catching performed in the weighing of direct cattle is obtained from other jobs in the yards as needed, and because the jobs occur sporadically and are usually of relatively shortly duration, the labor for them is not charged to weighing direct cattle, but to the job from which workers were obtained. It is estimated that a part of the labor charged to weighmastering could be saved by assigning the job of weighing direct cattle to the driver driving the cattle.

TABLE 16.—*Weighing dealer cattle: Daily average number hours scale block open, drafts weighed, labor used, draft weighed per hour, and labor used per draft weighed*

Day	Hours scale block open	Drafts weighed	Labor used	Drafts weighed per hour [1]	Labor used per draft weighed
	Number	*Number*	*Man-hours*	*Number*	*Man-hours*
Monday	8	78	56	9.8	0.72
Tuesday	8	93	55	11.6	.59
Wednesday	8	73	57	9.1	.78
Thursday	8	52	46	6.5	.88
Friday	8	19	46	2.4	2.42
Total or average	40	315	260	7.9	.83

[1] Excludes transfer and dollar tickets.

Summary of present utilization of labor

In 1955 the total labor used for weighing market, dealer, and direct cattle was 68,380 man-hours. The amount of labor used per draft, including transfer and dollar tickets, was 0.23 man-hour.

The labor used for weighing market cattle was 53,024 man-hours, an average of 0.21 man-hour per draft. The labor used for weighing dealer cattle was 13,487 man-hours, an average of 0.82 man-hour per draft. The labor used per draft for weighing dealer cattle was almost 4 times that used for market cattle. The labor used for the weighmaster in weighing direct cattle amounted to 1,869 man-hours.

The labor used in performing specific jobs in the weighing of market, dealer, and direct cattle varies considerably (table 17). The differences in the amount of labor used in performing specific jobs in weighing market cattle is primarily due to the difference in the time

TABLE 17.—*Weighing cattle: Labor used for weighing market, dealer, and direct cattle by jobs*

Type of job	Market cattle		Dealer cattle [1]		Direct cattle [2]		Total	
	Man-hours	*Percent*	*Man-hours*	*Percent*	*Man-hours*	*Percent*	*Man-hours*	*Percent*
Weighmastering	12,422	23.4	2,493	18.5	1,869	100.0	16,784	24.5
Backgating	8,356	15.7	2,083	15.5	0	0	10,439	15.3
Counting	10,108	19.1	2,109	15.6	0	0	12,217	17.9
Driving	12,025	22.7	4,427	32.8	0	0	16,452	24.0
Pen catching	10,113	19.1	2,375	17.6	0	0	12,488	18.3
Total	53,024	100.0	13,487	100.0	1,869	100.0	68,380	100.0

[1] Includes labor used for preparing transfer and dollar tickets.
[2] Includes only weighmaster labor for weighing direct cattle arriving at night and on Saturday and Sunday.

workers are shifted to other jobs when weighing is completed. The amount of labor used for performing specific jobs in weighing dealer cattle is fairly constant, except for driving, which takes a large amount of labor because two drivers are used regularly at the dealer scale block.

The amount of labor used for weighing market cattle varies widely by day of week because labor is constantly being adjusted to the workload. Of the 53,024 man-hours used for weighing market cattle, 30.7 percent was used on Monday, 27 percent on Tuesday, 21.2 percent on Wednesday, 12.5 percent on Thursday, and 8.6 percent on Friday.

The amount of labor used for weighing dealer cattle is relatively constant each day of the week because the scale block for weighing dealer cattle remains open 8 hours a day, Monday through Friday, with a full scale crew regardless of the workload.

Proposed facilities

Seven scale blocks are included in the proposed facilities. One of the scale blocks used in 1955 would remain in the same location for weighing direct cattle. Six new blocks are proposed for weighing market and dealer cattle.

The six new scale blocks are arranged in a row across the market in back of the sales pens. Each block is composed of sorting pens, scale platform and house, and catch pens. The location of scale blocks in the yard proper and the arrangement of the component part of each block is shown in figure 43.

Each of the new blocks would have 16 sorting pens, which would permit continuous weighing; one lot of cattle may be sorted while another is being weighed. The 96 sorting pens provide 8,928 square feet of pen space. Sorting pens are not essential for weighing direct cattle.

Scale platforms and houses for the six scale blocks are the same size. Scale beams are of 20,000-pound capacity and platforms are 12 by 24 feet. These scales would permit the efficient weighing of small drafts.

The scale houses would be 12 by 20 feet. The roof of each scale house would be extended to cover the scale platform. The houses contain an enclosed area for the weighbeam, working space for the weighmaster, and a combination waiting room and passageway.

Each scale block would have 87 catch pens, ranging in size from 10 by 15 feet to 20 by 20 feet, providing a total of 522 pens and 128,892 square feet of space. As the most remote catch pen is only 170 feet from the "off" end of the scale platform, driving distances for yarding cattle would be comparatively short. A 3-foot alley is suggested through the row of catch pens to give workers easy access to all pen areas.

In addition, a block of 24 purchaser pens is provided behind each scale block, into which the cattle of the larger buyers would be moved from the catch pens. These pens are 18 by 27 feet and 34 by 36 feet. The 144 pens would provide 105,408 square feet. Roughly, the capacity of the catch pens and purchaser pens is estimated at 8,500 cattle, or about 28 square feet per head. This is about 30 percent greater than 1955 facilities and is made possible by providing pens of a size more in line with the size of lots yarded in them.

Two 3-foot passageways through the scale blocks are suggested to provide workers easy access to different alleys in the same scale block or between scale blocks.

The proposed arrangement of the scale blocks should permit much greater efficiency in the sorting and weighing of cattle than is obtained with present facilities (fig. 43). It allows any commission firm or dealer ready access to all scale blocks. This means that a scale may be closed at any time without impairing the weighing efficiency of a particular firm.

Proposed operations and labor utilization

The proposed operations and labor utilization for weighing cattle are discussed on the basis of weighing market and dealer cattle and weighing direct cattle.

WEIGHING MARKET AND DEALER CATTLE.—The separate scale block for weighing dealer cattle

can be abolished. With improved facilities, dealer and market cattle can be weighed at the same scale blocks. Preparation of transfer and dollar tickets, which is being performed by the weighmaster at the dealer scale, can be assigned to a clerk in the general office in conjunction with his other duties. The clerk should perform the job faster and with fewer errors than the weighmaster. The same jobs now performed in weighing market and dealer cattle should be performed with the improved scale blocks.

Six scale blocks are proposed for weighing market and dealer cattle. However, it is estimated that, in general, only five scale blocks would be needed for weighing. The sixth scale block is designed to take care of needs on peak volume days; it would probably be used only 20 to 30 days a year. The organization of labor should permit a crew for the sixth scale to be assembled when needed, from other jobs. The number of scale blocks needed varies daily; the proposed arrangement permits scale blocks to be opened and closed in accordance with the workload (table 18). It is estimated that scale blocks would be idle about 25 percent of the time they are open, because of slow sales and other delays inherent in stockyard operations. Thus the number of drafts weighed per hour when the scale blocks are in operation would approximate 55—the number commonly attained on terminal yards with an arrangement of facilities similar to the one proposed.

An assumed work schedule for workers weighing market and dealer cattle by type of job and day of the week is shown in table 80. It provides for 31,200 man-hours annually. The proposed labor is the same for all jobs—6,240 man-hours annually.

Of the 31,200 man-hours proposed for weighing cattle, 33.3 percent would be used on Monday, 30 percent on Tuesday, 23.3 percent on Wednesday, 10 percent on Thursday, and 3.4 percent on Friday.

WEIGHING DIRECT CATTLE. — It is proposed that a driver at the cattle truck dock be assigned the duty of weighmastering for direct cattle arriving at night and on Saturday and Sunday in conjunction with his other duties. Based on this proposal, it is estimated that the labor requirement for weighmastering direct cattle would be 935 man-hours and provisions are made for the labor in the work schedule for driving cattle arriving by truck (table 80).

Labor for such jobs as backgating, counting, driving, and pen catching performed in connection with weighing would be obtained from workers assigned to other jobs in the yards. No provisions are made for this labor because it would be charged to the jobs from which the workers were obtained.

Summary of proposed labor utilization

The total labor proposed for weighing market, dealer, and direct cattle amounts to 32,135 man-hours annually, or about 0.11 man-hour per draft weighed. The amounts of labor proposed for weighmastering, backgating, counting, driving, and pen catching in weighing market and dealer cattle are the same—6,240 man-hours each annually. An additional 935 man-hours is proposed for weighmastering for direct cattle arriving on the market at night, and on Saturday and Sunday.

The amount of labor proposed for weighing market, dealer, and direct cattle varies widely by day of the week. Of the total 32,135 man-hours proposed annually, 32.8 percent would be used on Monday, 29.6 percent on Tuesday, 23.1 percent on Wednesday, 10.2 percent on Thursday, 3.5 percent on Friday, 0.3 percent on Saturday, and 0.5 percent on Sunday.

Comparison of present and proposed labor utilization

The labor proposed for weighing cattle with improved facilities and operations is 32,135

TABLE 18.—*Weighing market and dealer cattle: Proposed daily average number of scale blocks open, hours scale blocks open, drafts weighed, labor, drafts weighed per hour, and labor used per draft weighed*

Day	Scale blocks open	Hours scale blocks open	Drafts weighed	Labor proposed	Drafts weighed per hour	Labor used per draft weighed
	Number	*Number*	*Number*	*Man-hours*	*Number*	*Man-hours*
Monday	5.0	40	1,766	200	44.2	0.11
Tuesday	4.5	36	1,598	180	44.4	.11
Wednesday	3.5	28	1,213	140	43.3	.12
Thursday	1.5	12	555	60	46.2	.11
Friday	.5	4	121	20	30.3	.17
Total or average		120	5,253	600	43.8	.11

man-hours annually—0.11 man-hour per draft. The amount of labor used for weighing and for preparing transfer and dollar tickets in 1955 was 68,380 man-hours—0.23 man-hour per draft. Weighing cattle with improved facilities and methods would require an estimated 36,245 man-hours, or 53 percent less labor annually than in 1955.

The labor proposed for weighing all cattle with improved facilities and operations as compared with the labor used in 1955 and the estimated benefits by jobs performed in weighing cattle are shown in table 19. There are labor savings in each job performed.

The estimated daily labor for weighing all cattle with 1955 facilities and operations, compared with proposed facilities and operations, is shown in table 20. The proposed arrangement of scale blocks will permit flexibility in opening and closing and permit labor to be withdrawn from the scale blocks as the workload decreases, by day of week. The amount of labor proposed for weighing cattle is less each day Monday through Friday than that used in 1955, with the greatest reductions on Thursday (65 percent) and Friday (84 percent).

TABLE 19.—*Weighing all cattle: Comparison of present and proposed labor utilization by jobs*

Type of job	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations
	Man-hours	*Man-hours*	*Man-hours*
Weighmastering	16,784	7,175	9,609
Backgating	10,439	6,240	4,199
Counting	12,217	6,240	5,977
Driving	16,452	6,240	10,212
Pen catching	12,488	6,240	6,248
Total	68,380	32,135	36,245

TABLE 20.—*Weighing all cattle: Comparisons of present and proposed labor utilization, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	19,464	10,538	8,926	45.9
Tuesday	17,408	9,524	7,884	45.3
Wednesday	14,479	7,415	7,064	48.8
Thursday	9,368	3,278	6,090	65.0
Friday	7,129	1,114	6,015	84.4
Saturday	217	108	109	50.2
Sunday	315	158	157	49.8
Total	68,380	32,135	36,245	53.0

Keying Cattle

Present facilities

Catch pens of the nine scattered scale blocks are used for keying cattle at the Fort Worth yards. These pens have been previously described in this report.

Keying workload

Keying cattle consists primarily of turning cattle out of the catch pens, where they have been yarded after weighing, to purchasers. The number of cattle turned out of catch pens to purchasers is related to the daily weighing volume of market and dealer cattle, since most of the cattle are turned out to purchasers the same day they are weighed. Occasionally cattle are left in catch pens overnight and turned out the following day. Table 21 shows the estimated pens of cattle turned out to purchasers, by day of the week. It is estimated that 118,464 pens of market and dealer cattle were turned out of scale block catch pens to purchasers in 1955. The average number of cattle turned out per pen was seven head, but wide departures from the average were common. The number of pens turned out varied widely by day of the week, ranging from about 35 percent of the total workload on Monday to about 4 percent on Friday. No data were obtained on the number of turnouts made on Saturday and Sunday, but the workload on these days is comparatively light.

TABLE 21.—*Keying cattle: Pens of cattle turned out to purchasers, by day of the week* [1]

Day of week	Pens of cattle turned out	
	Number	*Percent*
Monday	40,962	34.6
Tuesday	34,602	29.2
Wednesday	25,859	21.8
Thursday	12,614	10.7
Friday	4,427	3.7
Total	118,464	100.0

[1] Based on an examination of keyman's record books and an average of seven cattle per pen.

A second duty in keying cattle consists of unlocking the pen gates and checking the number of cattle in the pens of each of the various firms each morning, Monday through Friday. The workload for this job is directly related to the number of cattle and the number of pens in which cattle are yarded. There are 922 sales and dealer pens in the yards with capacities ranging from 2 or 3 head to more than 50 head of cattle. The number of cattle and the number of pens in which cattle are yarded varies widely by days of the week. However, no data

were obtained on the number of pens cattle were yarded into by days of the week.

Operations and labor utilization

Checking the number of cattle in the pens of each of the various firms each morning involves unlocking holding pen gates, counting the cattle, and recording the count. Checking out cattle to purchasers involves maintaining records on cattle yarded in catch pens, counting the cattle in the pens, and checking the count against previously recorded counts. The purchaser's signature is obtained for the count, and catch pen gates are closed and locked (fig. 18). This work is referred to as making turnouts. It is the first job performed in checking cattle out of the market. The workers keying cattle perform both jobs.

BN-6092

Figure 18.—A keyman checking out a lot of cattle to a purchaser.

The keying crew consists of nine workers, Monday through Thursday, and eight workers on Friday. These workers begin at 6 a. m. Ordinarily one worker is assigned to the catch pens back of each scale. The time from 6 a. m. to 8:30 a. m. is devoted to checking cattle of the commission firms and dealers. Turnouts to purchasers usually begin at 8:30 a. m. Cattle left in the catch pens by purchasers overnight occasionally may be turned out earlier. Frequently, the turnouts are not completed at 2 p. m., the end of the 8-hour shift, and the workers are required to work overtime or other workers are assigned to the keying jobs. One worker does the keying on Saturday and Sunday for the entire cattle division. Work hours for the week-end are usually from 7 a. m. to 3 p. m.

Observations were made of a worker checking cattle in pens assigned to commission firms at one scale block between 6 a. m. and 8:30 a. m. The worker unlocked sales pen gates and checked cattle in the pens for 32 minutes, turned out cattle for 10 minutes, and swept out the scale house for 7 minutes. The remainder of the time he was idle. During the 2.5-hour period the worker was engaged in productive work 33 percent of the time and idle 67 percent. This observation indicates that the job of checking cattle in pens assigned to the various firms does not justify the use of a full-time worker at each scale block. Furthermore, the same cattle are counted by a checker as they are unloaded, a counter as they leave the chute pen, and a driver as they enter the pen. The gate to the pen is then locked. The fourth counting of the same cattle by keymen early in the morning appears unnecessary and represents a waste of labor.

The average number of pens of cattle turned out per worker ranged from 88 on Monday to 11 on Friday. Records of individual workers turning out pens of cattle showed a wide variation by scale blocks on the same day, and by days of the week.

One observation of a worker turning out pens of cattle to purchasers indicated that he was engaged in productive work only 25 percent of the time, and idle 75 percent of the time. Indications are that keying is not a full-time job at any one scale block, but because the scale blocks are widely scattered it is impractical for one worker to do the keying for two sets of catch pens.

Only a few turnouts are made on Saturday and Sunday, but keying is done on these 2 days to maintain a satisfactory relationship with buyers.

Turning out cattle to purchasers is an important function. Keymen are a major contact of the stockyards with the purchasers. The operation should be performed courteously, as well as efficienctly. Sometimes several purchasers will present their credentials for cattle to a keyman at the same time; at other times no work is available for the keyman. Unavoidable delays are an inherent characteristic of this operation.

The total labor used for keying cattle in 1955 was 22,692 man-hours. The amount of labor used was relatively constant on Monday, Tuesday, and Wednesday (about 21 percent each day). Eighteen percent of the total labor was used on Thursday, 12 percent on Friday, 2 percent on Saturday, and 3 percent on Sunday.

Facilities proposed

The facilities involved in keying cattle are the catch pens and purchaser pens discussed with the proposed scale blocks for weighing cattle.

Proposed operations and labor utilization

It is proposed that the job of checking cattle early in the morning Monday through Friday in pens assigned to commission firms and dealers be abolished. Under the proposed organization the cattle in pens are counted twice. Two counts should be adequate to insure accuracy. The task of unlocking pen gates, performed in conjunction with checking, could be assigned to a watchman or fire patrolman. Locking of gates may not be mandatory with improved facilities, because the proposed arrangement of the improved sales pens provides for a compact area near the truck docks where cattle would be under the constant surveillance of the truck dock foreman and drivers at the truck dock. The abolishment of the checking job would remove the necessity for keymen between 6 a. m. and 8:30 a. m. Keymen would report for duty at 8:30 a. m.

The same operations employed with 1955 facilities in turning cattle out of pens to purchasers should be used in turning out cattle with improved facilities. Improved facilities, however, permit keymen to be assigned to keying for all catch and purchaser pens, rather than any specific set of pens. Thus the number of keying workers required would be smaller with improved facilities than in 1955. The proposed arrangement of catch and purchaser pens provides keymen ready access to all such pens.

Keymen also should assemble small lots of cattle, purchased by the same buyer and yarded in several different catch pens, into large lots and yard them in purchaser pens. This operation should insure empty catch pens within a short distance of the scales at all times for yarding cattle after they are weighed. Assembly of small lots from several catch pens into one lot and yarding cattle into a purchaser pen should provide for a more efficient utilization of pen space. The suggested change in the performance of the keying job would not necessarily reduce the current workload for turning out cattle, but would shift it from one area of work to another. The suggested changes in the operation should enable purchasers to collect their cattle considerably faster than was possible in 1955.

Based on observations of the keying operations being performed with present facilities and of the keying operations in other terminal yards, an assumed work schedule is developed for workers keying cattle with improved facilities (table 80). This work schedule provides for 32 man-hours on Monday, Tuesday, and Wednesday; 24 man-hours on Thursday; 16 man-hours on Friday; and 8 man-hours each on Saturday and Sunday. It provides for 152 man-hours weekly and 7,904 annually.

Comparison of present and proposed labor utilization

The labor proposed for keying cattle with improved facilities and operations is 7,904 man-hours, compared with 22,692 man-hours used in 1955. A saving of about 65 percent in labor results from keying with improved facilities. The labor proposed for keying is less for each day of the week than that used in 1955 (table 22).

TABLE 22.—*Keying cattle: Present and proposed labor utilization, by day of week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	4,963	1,664	3,299	66.5
Tuesday	4,930	1,664	3,266	66.2
Wednesday	4,768	1,664	3,104	65.1
Thursday	4,170	1,248	2,922	70.0
Friday	2,811	832	1,979	70.4
Saturday	465	416	49	10.5
Sunday	585	416	169	28.9
Total	22,692	7,904	14,788	65.2

Loading Out Cattle by Trucks

Present facilities

Facilities used in loading out cattle by trucks includes an unpaved truck approach, 15 truck chutes and chute pens, and 62 T-pens (fig. 19). The eastern half of the truck approach at the north end of the cattle yards is used for loading out trucks. It is about 110 feet deep and 300 feet long. There is adequate space for trucks to turn and back to the chutes. The chutes and chute pens are about 20 feet wide and 22 feet deep. The chutes are 6 feet wide and 8 feet deep. The truck end of the chutes is 50 inches high and the "on" end of the chute is at ground level. The chutes do not have a platform. The chute pens are about 20 feet wide and 14 feet deep. The truck chutes and chute pens are too small to efficiently handle the lots loaded. Occupying an area of about 6,490 square feet, they are comparatively old, and there are too many of them for the volume loaded.

Behind the truck docks are 62 T-pens, which are used by purchasers to assemble and hold cattle near the docks before loading. The T-pens range from 16 by 22 feet to 32 by 56 feet. Most of them are too small. The number of pens is excessive for the volume loaded out. The 62 T-pens provide a pen space area of about 27,344 square feet.

BN–6093

Figure 19.—Truck dock for loading cattle out of the market.

The workload

Purchasers collect cattle from the catch pens at the various scale blocks and drive them into the T-pens near the loadout chutes. The sizes of the individual lots collected vary widely, and frequently, purchasers collect two or more lots before a full load is assembled. Each lot of cattle that purchasers drive into T-pens is checked by stockyard workers; this is the only job stockyard workers do. Purchasers then drive the cattle to the chutes and load them onto trucks (fig. 20).

BN–6094

Figure 20.—Loading cattle on a truck at the Fort Worth Stockyards.

For this analysis, the unit of work for stockyard workers is considered to be a truckload rather than individual lots checked. In 1955, 16,055 trucks with 328,146 cattle were checked out of the market. The average truck contained 20.4 cattle, but the size of individual loads varied considerably.

More trucks were loaded out on Tuesday than any other day (table 23). Loading is usually heavy on Monday, Tuesday, and Wednesday, and comparatively light on Thursday and Friday. The number of trucks loaded out varies considerably by hours of the day. Loadouts are heaviest from 11 a. m. to 6 p. m. On Monday, Tuesday, and Wednesday as many as 30 to 40 trucks an hour may be loaded out during these hours. Before 11 a. m. and after 6 p. m. every day truck loadouts average about four per hour.

Operations and labor utilization

In checking cattle, the gate is locked after cattle are driven into T-pens. The animals are counted and checked against the number of animals shown on the purchaser's clearance card. Cattle are also counted out of the T-pens to purchasers. This count is recorded on the clearance card and filed. Periodically, workers

TABLE 23.—*Loading out cattle by trucks: Trucks of cattle loaded out, by day of week*

Day	Trucks loaded out		Cattle	
	Number	*Percent*	*Number*	*Percent*
Monday	3,705	23.0	79,365	24.2
Tuesday	4,459	27.8	95,108	28.9
Wednesday	3,809	23.7	80,886	24.7
Thursday	2,483	15.5	45,188	13.8
Friday	1,599	10.0	27,599	8.4
Total	16,055	100.0	328,146	100.0

checking out cattle deliver the clearance cards to the clerk at the truck dock for receiving cattle. While cattle are held in T-pens, they are checked by Federal and State inspectors. Cattle are held for varying times in T-pens, depending upon such factors as the time required for buyers to assemble their cattle from purchaser pens and the time required for checking and inspecting.

The work day for checking cattle is 9 a. m. to 11 p. m. on Monday, Tuesday, Wednesday, and Thursday. On Friday the hours are 9 a. m. to 5 p. m. The checking crew consists of three workers. The hours of the workers performing the checking job are staggered to level out the workload and labor load. One checker reports for duty at 9 a. m. and works until 5 p. m. Another reports for duty at 3 p. m. and works until 11 p. m. This schedule permits 2 checkers to be on duty from 3 p. m. to 5 p. m. When the workload is unusually heavy, a third worker reports for duty at 11 a. m. and works until 7 p. m. The workers on the 11 a.m. to 7 p. m. and 3 p. m. to 11 p. m. shifts do other jobs in the yards on Friday. Regardless of how the hours may be staggered, however, there are

periods when checkers may have more work at one time than they can handle, and other times when they have no work. One worker must be on duty at all times within the prescribed hours to check out cattle when purchasers are ready. The job cannot be readily combined with another job.

Observations of a worker checking truckloads of cattle out of the market between 3 p. m. and 11 p. m. showed that he was productive 52 percent of the time and was idle 48 percent of the time. During this time he checked out 32 trucks with 544 cattle. The average productive time per truckload amounted to 7.8 minutes. About 5 minutes were required to check the cattle and 2.8 minutes to check records and deliver cards to the clerk at the receiving dock. There was no work to perform from 10 p. m. to 11 p. m.

The purchaser of cattle is responsible for assembling, driving, and loading cattle on trucks. The 1955 arrangement of facilities necessitates out-of-line drives, back drives, and frequent delays in driving cattle from catch pens to truck docks. This is a major problem for purchasers buying at the market.

In 1955 the total labor used for checking cattle loaded out on trucks amounted to 4,336 man-hours—about 0.27 man-hour for each truck load. The amount of labor used varied by day of week. Of the total labor used, 26.3 percent was used on Monday, 25.3 percent on Tuesday, 22 percent on Wednesday, 19.2 percent on Thursday, and 7.2 percent on Friday.

Facilities proposed

The truck loading-out dock should be relocated at the south end of the market. A truck approach, a truck dock with 6 chutes, and 18 T-pens are proposed for loading out. The reduction in facilities for loading out is made possible by a general rearrangement of the yards which should enable buyers to load out much faster. In 1955 the number of chutes was more than needed.

The proposed truck approach for the dock is 80 feet wide and 135 feet deep. This area should be ample for trucks to turn and back to the dock.

Five chutes are proposed for loading out cattle on large trucks. These chutes, including chute pens, are 14 by 33 feet. The platform would be 3 feet deep and the chute pens 30 feet. One truck chute, 10 by 33 feet, is designed for small trucks. The six truck chutes and chute pens comprise an area of 2,640 square feet. The sizes of the chute pens proposed are more in line with the sizes of the lots loaded out.

The 18 T-pens range from 11 by 14 feet to 24 by 34 feet. They provide pen space of about 9,656 square feet. Adjacent to the T-pens are 14 utility pens that may be used for loading out if the occasion demands.

Proposed operations and labor utilization

The present method of checking cattle leaving the market on trucks should be maintained. It is proposed, however, that workers checking cattle also drive purchasers' cattle from the purchaser pens and catch pens to the T-pens. The proposed arrangement of these pens provides for short, direct drives without delays from the crossflow of traffic. Time required for driving purchasers' lots would not be much greater per truckload. It is estimated that the unavoidable delay time incurred by workers in 1955 could be used for driving cattle.

A work schedule for workers loading out cattle by trucks is shown in table 80. The work schedule provides for 4,992 man-hours annually. Of the total labor proposed for loading out cattle 25 percent is proposed for each day Monday through Wednesday, 16.7 percent is proposed for Thursday, and 8.3 percent for Friday.

Comparison of present and proposed labor utilization

The estimated annual labor for loading out cattle by trucks with proposed facilities and operations is 4,992 man-hours, compared with 4,336 man-hours used in 1955. The labor proposed is greater than that used in 1955, but the proposed operations provide for rendering the additional service of driving purchaser's cattle from purchaser pens and catch pens to the T-pens at the loading dock. This added service probably would be prohibitive with 1955 facilities. The labor for loading out cattle by trucks with proposed facilities and operations is slightly larger for each day of the week, except Thursday, than in 1955 (table 24).

TABLE 24.—*Loading out cattle by truck: Present and proposed labor utilization by day of week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	1,141	1,248	−107	9.4
Tuesday	1,095	1,248	−153	14.0
Wednesday	956	1,248	−292	30.5
Thursday	832	832	0	0
Friday	312	416	−104	33.3
Total	4,336	4,992	−656	15.1

Water Patrolling

Present facilities

Facilities include water hydrants and troughs located in pens throughout the cattle division,

a water reservoir, and a deep well and pump. The reservoir is about 60 feet square and 11 feet deep. It stores water from the well and city water, which is used to supplement the supply. The well and reservoir are about 700 feet north of the truck docks (fig. 21).

BN–6095

Figure 21.—The Stockyards water reservoir.

Water patrolling workload

Water patrolling consists of watching for open hydrants, closing valves, watering cattle, checking the water level, and maintaining an adequate supply in the reservoir. The only established workload for water patrolling is regular visits to the reservoir. The work generally increases as the number of cattle in the yards increases.

Operations and labor utilization

Patrolling involves continual walking over the yards. When an open hydrant is located, the worker closes the valve (fig. 22). Watering cattle includes opening and closing the water valve at hydrants, to fill troughs. Occasionally, clogged water drains have to be opened. Patrolling also includes reading and recording the water level gauge and determining whether well water or city water will be used. If the reservoir needs water, the pump is started or the city water is turned on. When the proper water level is obtained the pump is stopped or the city water turned off. Occasionally, water patrolmen are required to cut off the water in the yard and drain the water lines in preparation for freezing weather.

Water patrolling is done by stockyards employees every day for 24 hours. The day is divided into the three standard 8-hour shifts used for other operations.

One worker is assigned to the job on each

BN–6096

Figure 22.—A water patrolman closing a water valve.

shift, but workers from other crews are frequently assigned to the job for short durations, particularly on the first shift. The duties vary to some extent by shifts, and by days of the week. On the first shift workers perform all duties, except watering market, dealer, and packer cattle. Commission firms, dealers, and packers water their cattle on the first shift the first 5 days of the week. Cattle arriving at the market for rest, feed, and water, are watered on all shifts by the patrolmen. On Saturday and Sunday the worker on the first shift waters packer and market cattle upon request. The worker on the first shift confines his activities strictly to the cattle division. The workers on the second and third shifts perform all duties, but watering is confined to requests by shippers. Workers on the second and third shifts also water patrol the hog and sheep division; 1½ hours of their day's work are charged to that division.

Workers on the second shift were observed for 11 hours. During this time they watered six pens of cattle, and closed 64 hydrant valves. The time required to water a pen of cattle or to close a valve is comparatively small. The workers spent most of their time patrolling the yards and watching for open valves. They usually made 3 to 4 trips to the reservoir during a shift. Workers take about 10 minutes to go from the cattle truck dock to the water reservoir, perform the necessary functions, and return.

It appears that the primary function of the water patrolling job is to patrol the yards and

watch for open water hydrants. Employees of the independent agencies operating at the market do most of the watering. Sometimes employees of the marketing agencies leave hydrants open until the troughs overflow and water is wasted and the surrounding yard area becomes wet and muddy. The wasted water and extra cleaning required add to the operating cost of the market.

In 1955, 11,688 man-hours were used water patrolling the cattle division. Aprroximately 60 percent of the labor was used on the first shift, 20 percent each on the second and third shift.

Facilities proposed

Proposed facilities would be similar to those used in 1955, but the pens in which watering facilities are located would be more compact. A smaller patrol area would be involved.

Proposed operations and labor utilization

Water conservation and lower cleaning cost should be the responsibility of all agencies operating on the yards, since they are directly concerned with the marketing cost to shippers. Therefore, it is suggested that the stockyards ask the cooperation of all agencies to prevent waste of water. The failure of any agency to cooperate should serve as grounds for the removal of the agency from the yards.

During the sales period, market activities are at their height, and occasionally workers of the various agencies might become engaged in other activities and forget to close a valve. Water drains occasionally clog up and have to be cleaned out. Periodic checks should be made on the water reservoir. It is proposed that one worker be provided by the stockyards for water patrolling between the hours of 7 a. m. and 3 p. m. each day of the week. This worker would perform the same duties that are performed on the first shift. He would patrol the entire stockyards on Saturday and Sunday and only 80 percent of his labor would be charged to the cattle division for these days.

Cattle that arrive on the second and third shifts should be watered by drivers at the truck docks upon request. The workload is light and drivers could easily water cattle by permitting water to flow into the trough slowly. Upon returning later drivers could close the hydrant. This method is now being used in the hog and sheep division. The compact arrangement of the proposed holding pens would result in drivers constantly passing pens in which water was left running in troughs, and the problem of workers forgetting open valves should be eliminated.

Checkers at the truck docks can make periodic checks of the water reservoir on the second and third shifts. The time required to perform this job is comparatively small. The number of trips made per night could probably be reduced, particularly during the latter part of the week. The time required for drivers and checkers to water cattle and to make periodic checks of the reservoir on the second and third shifts would be small. No time is charged for these jobs. The work schedule proposed for checkers and drivers provides for adequate labor for the jobs.

Table 80 shows the work schedule for water patrolling in the cattle division by day of week. The work schedule provides for 8 man-hours each day, 56 man-hours weekly, and 2,912 man-hours annually.

Comparison of present and proposed labor utilization

Table 25 compares the labor used in 1955 for water patrolling in the cattle division with the suggested labor with proposed facilities and operations, by days of the week. The amount of labor proposed is smaller for each day of the week. The total annual reduction in labor is estimated at 8,922 man-hours. This is approximately 75 percent less labor than that used in 1955. The proposed method might accomplish the same reduction with present facilities. Improved facilities, however, that would result in compact areas for the various agencies at the market would aid materially in decreasing the waste of water.

TABLE 25.—*Water patrolling in the cattle division: Present and proposed labor utilization, by day of week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	1,791	416	1,375	76.8
Tuesday	1,879	416	1,463	77.9
Wednesday	1,693	416	1,277	75.4
Thursday	2,259	416	1,843	81.6
Friday	1,384	416	968	69.9
Saturday	1,115	333	782	70.1
Sunday	1,547	333	1,214	78.5
Total	11,668	2,746	8,922	76.5

Fire Patrolling

The fire patrolling described in this section is primarily done by weighmasters. Fire patrolling by regular watchmen is described in the section on watchman service.

Present facilities

The facilities involved in fire patrolling by weighmasters are all the facilities in their respective scale block areas.

Fire patrolling workload

No established workload exists for fire patrolling. Fire is a constant hazard to stockyards, and it appears that fire patrolling is mandatory, particularly on dry, hot, windy days.

Operations and labor utilization

Weighmasters are assigned the job of fire patrolling in their respective scale block areas when the scale is closed because of lack of business. Normally, the dealer scale block is not involved, because it remains open a specified time each day. Occasionally, workers other than weighmasters are assigned the job of fire patrolling for short periods. The job consists primarily of walking through the area assigned, watching for fires, and putting out lighted cigarettes and cigars. Once each hour, the fire patrollers report to the superintendent's office by telephone.

Indications are that fire patrolling by weighmasters is the outgrowth of a custom of assigning weighmasters to fire patrolling to complete their 8-hour day or their 40-hour week. The effectiveness of this procedure is difficult to determine. Late in the week, when the scales close early, as many as 6 or 7 workers may patrol at the same time in the cattle division. Weighmasters do not patrol during the first part of the week when the weighing workload is heavy and they are busy at the scales. This is true regardless of weather conditions. Regular fire patrolmen, classified as watchmen, patrol at the same time as weighmasters. Apparently, no attempt is made to coordinate the fire patrolling. Some fire patrolling by weighmasters and other workers probably is necessary, particularly during hot, dry, windy days.

In 1955, 5,402 man-hours were used for fire patrolling in the cattle division. On Monday 4.5 percent of the total labor was used, 10.2 percent on Tuesday, 16 percent on Wednesday, 31.2 percent on Thursday, 22.4 percent on Friday, and 15.7 percent on Saturday.

Proposed facilities

It is suggested that all facilities in the cattle division be included in the area fire patrolled by weighmasters and other workers who are assigned to the job for short periods of time.

Proposed operations and labor utilization

Preventing fires in the yards should be the responsibility of all workers at the stockyards and their cooperation should be solicited. They should be alerted each day when conditions are favorable for heavy losses from fires. Weighmasters should be assigned to other jobs, as well as to fire patrolling, to complete their specified number of hours for the day or for the week. It also is suggested that fire patrolling by weighmasters and other workers be coordinated with the work performed by regular fire patrolmen. The improved facilities which provide compact areas for all groups operating at the yards should minimize the need for fire patrolling.

A work schedule for fire patrolling by weighmasters and other workers, by day of week, is shown in table 80. This schedule provides for a total of 46 man-hours weekly or 2,392 man-hours annually. The labor outlined in the work schedule is coordinated with the work schedule proposed for regular fire patrolmen; 12 man-hours are proposed on Wednesday, Thursday, and Friday because regular fire patrolmen are not proposed for these days. The work schedule proposed for fire patrolling by weighmasters and other workers and the proposed work schedule for watchmen provide for fire patrol services each day. The amount of fire patrolling needed is difficult to determine. When more workers are needed for fire patrolling for short periods they can be obtained from the cleaning crew or the proposed labor pool. If weighmasters are not needed for fire patrolling, they should be assigned other jobs.

Comparison of present and proposed labor utilization

The annual labor suggested for fire patrolling with proposed facilities is 2,392 man-hours. This is 3,010 man-hours or 55 percent less than the amount used in 1955. Table 26 shows the amount of labor proposed for fire patrolling by day of week, compared with the amount used in 1955.

TABLE 26.—*Fire patrolling in the cattle division: Present and proposed labor utilization, by day of week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	244	312	−68	27.9
Tuesday	549	208	341	62.1
Wednesday	865	624	241	27.9
Thursday	1,687	624	1,063	63.0
Friday	1,209	624	585	48.4
Saturday	848	0	848	100.0
Total	5,402	2,392	3,010	55.7

Cleaning the Division

Present equipment and facilities

Cleaning equipment includes 3 mechanical loaders, 6 dump trucks, 4 tractors, 1 grader blade, 24 dump carts (1 cubic yard), manure dump, and an incinerator. All facilities and pen areas in the cattle division are cleaned. The cleaning equipment is housed in the stock-

yards barn on the west side and adjacent to the cattle division.

Cleaning workload

There is no established workload for cleaning. Factors such as bad weather and number of cattle affect the amount of cleaning necessary.

Operations and labor utilization

Cleaning is referred to as regular cleaning and irregular cleaning. Regular cleaning is performed by a crew comprised of about 10 workers and a full-time foreman. The workday for the crew is from 7:30 a. m. to 4 p. m. including a half-hour for lunch Monday through Friday. Workers in the regular cleaning crew are often shifted to other jobs in the yards.

Regular cleaning consists of general cleaning, cleaning pens and alleys, sweeping company barn, and cutting and spraying grass. General cleaning involves collecting trash from the exchange building, truck and rail docks, and scale houses in both the cattle and the hog and sheep divisions, hauling it to the incinerator, and burning it. It also includes cleaning around the scales. A truck driver and a helper, using a dump truck, do the general cleaning (fig. 23). Usually these workers finish the general cleaning in 4 to 8 hours, afterward performing other cleaning jobs. In 1955, 2,354 man-hours were used for general cleaning—1,247 man-hours of a truck driver's time, and 1,107 man-hours of general labor. It does not appear that general cleaning should be done each day. Furthermore, it appears that the workload could be minimized by instituting other cleaning prctices. Workers in other crews could clean around their respective work stations during idle periods.

Cleaning pens and alleys includes loading manure and debris from the floors onto the bed of a dump truck, hauling it to the manure pile, and dumping it (fig. 24). A crew for this job may consist of 4 to 6 or 7 workers, who use a loader and dump truck. One worker operates the loader, one drives the dump truck, and the rest use shovels or pitchforks to clean under water troughs, hayracks, and grain troughs (fig. 25). One worker stands on the pile and spreads the manure after it is dumped. He will also put out fires which occasionally occur from spontaneous combustion. Sometimes 2 or 3 crews clean pens and alleys.

Observations of pens and alleys being cleaned indicated that cleaning work is hampered by the constant shifting of workers to other jobs in the yards. Delays were common because crews were too small, particularly during the first part of the week, when volume of cattle was large. The loaders used were not standardized and appeared to be too large to perform the job efficiently. In 1955 a total of 13,319 man-hours of regular cleaning labor was

BN–6097

Figure 23.—Workers performing general cleaning.

BN–6098

Figure 24.—A truck dumping a load of manure at the manure pile

BN–6099

Figure 25.—Regular cleaning workers cleaning a pen.

used in cleaning pens and alleys. The amount of labor used varied by days of the week.

The floor of the barn is swept periodically; only 189 man-hours were used on it in 1955. Cutting and spraying weeds and grass includes maintaining the lawn at the exchange building and destroying weeds growing along the fences to minimize the fire hazard. These jobs also are done periodically by workers in the regular cleaning crew. In 1955, 2,740 man-hours were used for these jobs. Since the study was started the lawn at the exchange building has been converted into a parking area.

Irregular cleaning is done by workers assigned from other jobs in the yard to complete their 8-hour workday, or 40-hour week. The number of workers doing irregular cleaning varies widely, by days of the week, and also by hours within any given day. These workers clean pens and alleys with a tractor and dump carts (figs. 26 and 27). Tractors are used to haul the dump carts to the manure pile. Indications are that workers are shifted to the irregular cleaning to complete their 8-hour day or 40-hour week, regardless of whether they are needed.

The number of man-hours used at the Stockyards for cleaning is considerably greater than that used by some terminal yards of comparable size, even though they are located in areas where climatic conditions cause a more acute cleaning problem.

BN–6100

Figure 26.—Irregular cleaning workers cleaning an alley.

Summary of labor utilization for cleaning

A total of 29,139 man-hours was used in cleaning in the cattle division in 1955. Regular cleaning labor amounted to 18,602 man-hours, or about 64 percent of the total. Irregular cleaning labor amounted to 10,537 man-hours, or 36 percent of the total.

BN–6101

Figure 27.—A tractor driver hauling dump carts used by irregular cleaning workers.

The amount of labor used for regular and irregular cleaning varies widely by days of the week. About 8.7 percent of the total labor is used on Monday, 13.9 percent on Tuesday, 18.9 percent on Wednesday, 32.8 percent on Thursday, and 25.7 percent on Friday.

Proposed facilities

The equipment used in cleaning would be practically the same as in 1955. Research is needed to develop more efficient types of equipment. The proposed arrangement of new facilities would provide compact areas for the major operating groups, and the areas of heaviest cleaning would be smaller, with lower cleaning costs. Cleaning equipment would be housed in the storage area across the alley from the proposed maintenance building.

Proposed operations and labor utilization

The regular cleaning crew in the cattle division should be abolished. All cleaning should be done by workers assigned to cleaning to complete their 8-hour day or 40-hour week, or by workers from the proposed labor pool discussed in the chapter on Yard Service Operations.

The work schedule for workers cleaning in the cattle division is shown in table 80. Labor is not scheduled by specific operations performed. Workers who need additional jobs to complete their 8-hour day or 40-hour week would be assigned by the foreman as needed. The schedule provides for 358 man-hours weekly, or 18,616 man-hours annually. The estimated total needed annually for cleaning is 20,384 man-hours. Consequently, it is suggested that 1,248 man-hours on Tuesday and 520 man-hours on Wednesday be obtained from the proposed central labor pool. The estimated

total is based on the assumption that less labor would be needed to clean the sales-pen area because of its reduced size, and that the overall reorganization of the facilities would result in fewer workers being assigned to the cleaning to complete their 8-hour day or 40-hour week. Performing the cleaning operations with crews of proper size should increase efficiency.

The proposed work schedule provides for adequate labor to perform cleaning work on each day of the week except Monday. Observations of cleaning on Monday indicate that the demands for labor for other jobs were so great that full crews were difficult to maintain and cleaning was seriously hampered. No cleaning by organized crews should be attempted at any time unless a full crew of workers is available.

As previously pointed out, unavoidable delays are characteristic of livestock market operations. During delays in other yard operations, both day and night, workers should be organized to perform light cleaning jobs in the immediate vicinity of their work. Some terminal yards used this method effectively. No estimates are made of the number of man-hours which would be available for cleaning by this method.

Summary of proposed labor for cleaning

A total of 20,384 man-hours is proposed for cleaning in the cattle division. The amount of labor proposed for cleaning by day of the week varies widely. Of the total labor proposed, 6.4 percent is proposed for Monday, 18.6 percent for Tuesday, 19.2 percent for Wednesday, 23.2 percent for Thursday, and 32.6 percent for Friday.

Comparison of present and proposed labor utilization

The estimated labor for cleaning in the cattle division with proposed facilities and operations is 20,384 man-hours. This is 8,755 man-hours, or 30 percent, less than the 29,139 man-hours used for cleaning in 1955. Benefits from cleaning with proposed facilites and operations would come from reorganizing the facilities to provide a more compact and smaller sales-pen area.

The amount of labor proposed for cleaning in the cattle division is smaller for each day of the week than that used in 1955 (table 27).

Feeding

Feeding cattle is discussed in the section of this report on yard service operations. It is estimated that 80 percent of the total labor used for feeding livestock is used in feeding cattle.

Comparison of present and proposed labor utilization

The estimated labor required for feeding cattle with proposed facilities and methods is 26,591 man-hours. This is 14,814 man-hours, or 35.9 percent, less labor than was used for feeding cattle in 1955. The amount of labor proposed for feeding cattle is smaller for each day of the week than in 1955 (table 28). The reduction is primarily the result of reorganized facilities which provide for a small, compact sales-pen area.

TABLE 27.—*Cleaning in the cattle division: Present and proposed labor utilization by day of week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	2,530	1,300	1,230	48.6
Tuesday	4,060	3,796	264	6.5
Wednesday	5,498	3,900	1,598	29.1
Thursday	9,558	4,732	4,826	50.5
Friday	7,493	6,656	837	11.2
Total	29,139	20,384	8,755	30.0

Maintenance Services

Maintenance services for the stockyards are discussed under Yard Service Operations. An estimated 80 percent of the total labor used for maintenance services on the yards is used in the cattle division.

TABLE 28.—*Feeding cattle: Comparison of present and proposed labor utilization by day of week* [1]

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	7,025	4,267	2,758	39.3
Tuesday	6,435	4,267	2,168	33.7
Wednesday	6,882	3,611	3,271	47.5
Thursday	5,686	3,611	2,075	36.5
Friday	4,522	2,955	1,567	34.7
Saturday	4,346	2,955	1,391	32.0
Sunday	6,509	4,925	1,584	24.3
Total	41,405	26,591	14,814	35.8

[1] Based on the estimate that 80 percent of the total cost for feeding livestock is incurred in feeding cattle.

Comparison of present and proposed labor utilization

The estimated labor for maintenance services in the cattle division with improved facilities and operations is 21,631 man-hours. This is 11,098 man-hours, or 33.9 percent, less labor than was used in 1955. The present and pro-

posed labor for maintenance services by day of the week is shown in table 29.

TABLE 29.—*Maintenance services in the cattle division: Comparison of present and proposed labor utilization, by day of week* [1]

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	6,170	3,994	2,176	35.3
Tuesday	6,053	4,326	1,727	28.5
Wednesday	6,728	4,326	2,402	35.7
Thursday	6,796	4,326	2,470	36.3
Friday	6,662	4,326	2,336	35.1
Saturday	320	333	−13	4.1
Total	32,729	21,631	11,098	33.9

[1] Based on the estimate that 80 percent of the total cost of maintenance would be incurred in the cattle division.

Watchman Services

Watchman services for the stockyards also are discussed under yard service operations. It is estimated that watchman services for the cattle division requires 80 percent of the total labor used for watchman services.

Comparison of present and proposed labor utilization

With proposed facilities and operations the estimated labor for watchman services in the cattle division is 14,642 man-hours. This is 10,512 man-hours less than the 25,154 man-hours used in 1955. Improved facilities and operations should effect a 41.8 percent reduction (table 30).

TABLE 30.—*Watchman services in the cattle division: Comparison of present and proposed labor utilization, by day of week* [1]

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	4,306	2,288	2,018	46.9
Tuesday	4,534	2,288	2,246	49.5
Wednesday	4,306	1,830	2,476	57.5
Thursday	3,390	1,830	1,560	46.0
Friday	3,390	1,830	1,560	46.0
Saturday	2,142	2,288	−146	6.8
Sunday	3,086	2,288	798	25.9
Total	25,154	14,642	10,512	41.8

[1] Based on the estimate that 80 percent of the total cost for watchman services would be incurred in the cattle division.

Proposed Labor Pool

A proposed labor pool for the market is discussed in the section of the report under yard service operations. It is estimated that 80 percent of the unassigned labor in the labor pool would be used in the cattle division.

A labor pool with 9,793 man-hours of unassigned labor is suggested for the cattle division, to operate the sixth scale block on peak volume days and to do unexpected jobs which may arise periodically. The unassigned labor in the labor pool by day of the week is shown in table 31.

TABLE 31.—*Labor pool for the cattle division: Labor utilization by day of the week* [1]

Day	Labor	
	Man-hours	*Percent*
Monday	2,358	24.1
Tuesday	1,994	20.4
Wednesday	1,584	16.2
Thursday	982	10.0
Friday	1,356	13.8
Saturday	427	4.4
Sunday	1,092	11.1
Total	9,793	100.0

[1] Based on the estimate that 80 percent of the total unassigned labor in the labor pool would be used in the cattle division.

Other Facilities Proposed

In addition to the facilities already discussed for the cattle division, some others are needed for the most efficient handling of cattle. They include holding pens, catwalk, scale tower, communication system, and expansion area.

Holding pens

Proposed holding pens consist of sales, dealer, packer, and utility pens. A total of 1,595 holding pens, with 861,801 square feet of space, is suggested for the cattle division. Estimated capacity of these pens, at 42 square feet per head, is 20,500 cattle.

SALES PENS.—Out of the total holding pens proposed, 816 would be sales pens with an area of about 304,128 square feet. Estimated capacity of the sales pens, at 36 square feet (gross space) per head, is 8,400 head. These pens are designed in blocks 48 feet deep and 148 feet wide. Each block has 17 pens, ranging from 9 by 12 feet to 28 by 30 feet. The number and sizes of the pens were determined by an analysis of utilization of pen space in relation to the sizes of consignments of cattle received by commission firms on peak volume days. The proposed numbers of sales pens, by sizes, are shown in table 32.

DEALER PENS.—A total of 219 dealer pens with 132,911 square feet of space is proposed. Estimated capacity of these pens, which range from 16 by 20 feet to 36 by 80 feet, is 3,000 cattle. Most pens are of the smaller sizes. The

TABLE 32.—*Cattle division: Proposed sales pens, by sizes*

Pen sizes	Sales pens	
	Number	*Percent*
9 by 12 feet	96	11.8
10 by 12 feet	144	17.6
12 by 15 feet	96	11.8
12 by 18 feet	48	5.8
18 by 18 feet	96	11.8
14 by 30 feet	96	11.8
18 by 32 feet	96	11.8
22 by 30 feet	96	5.8
28 by 30 feet	48	5.8
Total	816	100.0

number and sizes of dealer pens have been estimated to provide all dealers with separate pens and to permit efficient operations.

PACKER PENS.—A total of 173 pens with 138,562 square feet of space is suggested for packers. Estimated capacity of packer pens, at 30 square feet per (net space) head, is 4,500 cattle. The number and sizes of packer pens proposed should be adequate to handle the direct cattle and the cattle purchased by the two major packers.

UTILITY PENS.—A total of 387 utility pens, with 286,200 square feet of space, is proposed. Estimated capacity of these pens is 4,600 cattle, at 62 square feet (net space) per head. They would be used by the different groups on the market when needed.

Catwalk

A catwalk 4 feet wide and 2,600 feet long is proposed for the cattle division. This new facility should prevent interferences in operations from employees and patrons walking in yards.

Scale tower

A scale tower about 15 feet square and 30 feet high is proposed for the cattle division. All yard operations in the cattle division could be controlled by supervisory workers in the tower. Such towers have proved highly satisfactory for terminal yards other than the one at Fort Worth.

Communications system

A communications system with a control center in the scale tower would permit two-way contact between scale tower, exchange building, and all major work stations.

Expansion area

A tract of partially improved land, 240 feet wide and 409 feet deep, is located on the west side of the cattle division. This area, owned by the stockyards, could be used when the volume of business warrants expansion of the cattle division. The tract is of ample size for another scale block and a set of purchaser pens.

Summary of Present and Proposed Facilities and Labor Utilization

Present and proposed facilities

The type and amount of facilities proposed for the cattle division as compared with present facilities are summarized in table 33. Major changes are suggested in facilities for receiving and loading out cattle by trucks, and in facilities for holding, weighing, and feeding cattle. However, the overall dimensions of the cattle division would remain approximately the same. In addition, a catwalk over the yards, a scale tower, and a communication system are proposed.

RECEIVING FACILITIES.—The truck approach for receiving cattle is increased from 36,850 to 67,100 square feet. This is made possible by moving the approach for loading-out trucks to the south end of the cattle division. No changes are suggested for the docks now used in receiving cattle arriving by large trucks, but two comparatively small trailer alleys are proposed for receiving cattle by small trucks to replace the one long alley now used. Forty-seven T-pens of variable sizes—23 fewer than are now in the market—are proposed for receiving cattle by large trucks.

PENS.—The number and sizes of the pens proposed are in line with the needs of the market. Twenty-five chute pens and 81 T-pens of variable sizes are proposed for receiving cattle by small trucks. The T-pens proposed are almost twice the number used in 1955, made possible by reducing the sizes of the present pens. T-pens may be used as sales pens on peak sales days.

Holding pens are increased from 1,137 pens with 928,819 square feet of space to 1,595 pens with 861,801 square feet. Estimated capacity of the proposed pens is 20,500 cattle as compared with the capacity of 16,000 in 1955. A 40 percent increase in the number of pens, a 28 percent increase in capacity, and a 7 percent decrease in area can be made by adjusting the sizes of sales, dealer, packer, and utility pens in line with the sizes of consignments received or lots of cattle handled.

A major adjustment is made in sales pens: The number of pens is increased 10 percent, the area is decreased 37 percent, and the capacity is increased from 7,800 to 8,400 cattle. Dealer pens are increased 22 percent in number and decreased 35 percent in area. The capacity is increased from 2,500 to 3,000 cattle. Packer pens are increased 80 percent in number and 24 percent in area—the capacity is increased from 3,700 to 4,500 cattle. More than twice as many utility pens are proposed, the area is more than doubled, and the capacity

TABLE 33.—*Cattle division: Comparison of present and proposed facilities by type of facility*

Item	Present facilities		Proposed facilities		Increase or decrease			
	Item	Area	Item	Area	Item		Area	
	Number	*Square feet*	*Number*	*Square feet*	*Number*	*Percent*	*Square feet*	*Percent*
Truck receiving:								
Truck approach	1	36,850	1	67,100	.....	.....	+30,250	+82.1
Docks and chute pens	15	7,961	15	7,961	.....	.....	.....	.....
T-pens [1]	70	22,800	47	14,112	−23	−32.9	−8,688	−38.1
Trailer alley	1	5,376	2	3,408	+1	+100.0	−1,968	−36.6
Chute pens	.....	.....	25	3,360	+25	.....	+3,360	.....
T-pens [2]	40	11,224	81	10,904	+41	+102.5	320	−2.9
Holding pens:								
Sales pens	743	485,426	816	304,128	+73	+9.8	−181,298	−37.3
Dealer pens	179	205,478	219	132,911	+40	+22.3	−72,567	−35.3
Packer pens	96	111,399	173	138,562	+77	+80.2	+27,163	+24.4
Utility pens	119	126,516	387	286,200	+268	+225.2	+159,684	+126.2
Subtotal	1,137	928,819	1,595	861,801	+458	+40.3	−67,018	−7.2
Rail receiving and shipping:								
Docks and chute pens	47	37,850	43	34,600	−4	−8.5	−3,250	−8.6
Shipping pens	81	75,789	86	46,089	+5	+6.2	−29,700	−39.2
Weighing:								
Scale platforms and houses	9	.....	7	.....	−2	−22.2	.....	.....
Scale pockets	9	.....	1	.....	−8	−88.9	.....	.....
Sorting pens	.....	.....	96	8,928	+96	.....	+8,928	.....
Catch pens	607	157,467	522	128,892	−85	−14.0	−28,575	−18.1
Purchaser pens	.....	.....	144	105,408	+144	.....	+105,408	.....
Truck shipping:								
Truck approach	1	36,850	1	25,432	.....	.....	−11,418	−31.0
Docks and chute pens	15	6,490	7	3,102	−8	−53.3	−3,388	−52.2
T-pens	62	27,344	18	9,656	−44	−71.0	−17,688	−64.7
Maintenance	4	25,470	1	[3] 19,090	−3	−75.0	−6,380	−25.0
Feeding:								
Buildings	3	38,691	3	26,535	.....	.....	−12,156	−31.4
Catwalk	.....	.....	1	2,600	+1	.....	+2,600	.....
Scale tower	.....	.....	1	.....	+1	.....	.....	.....
Communications system	1	.....	1	.....	.....	.....	.....	.....
Expansion area	1	97,979	1	97,979	.....	.....	.....	.....

[1] T pens at the truck dock.
[2] T pens at the trailer alley.
[3] Includes proposed storage area for tractors, trucks, and cleaning equipment.

is increased from 2,000 to 4,600. Smaller pens should result in more efficient utilization of pen space, reduce the area requiring intensive cleaning, and increase the overall operating efficiency.

WEIGHING FACILITIES.—Seven scale blocks are proposed, instead of the 9 that were used in 1955. The reduction is made possible by arranging the scales in the yards so that all commission firms and dealers will have ready access to any scale block. Six scale blocks would be new; they would be used for weighing market and dealer cattle. One of the scales used in 1955 would be used for weighing direct cattle. The 6 new scale blocks would have 96 sorting pens and 522 catch pens, insuring adequate space for continuous sorting and weighing and for holding cattle temporarily after weighing. In addition, 144 purchaser pens with 105,408 square feet of space are suggested for assembling and holding cattle until purchasers call for them. The capacity of the purchaser pens is roughly estimated at 8,500 cattle, or about 30 percent more than in 1955.

LOADING-OUT FACILITIES.—The location of 7 truck docks and 18 T-pens for loading out at the south end of the cattle division assures a straight flow of cattle through the yards. Roughly, these proposed facilities amount to only a third of the number used in 1955.

STORAGE AND MAINTENANCE.—Two new buildings are suggested for storing hay in the cattle division. One of the present hay barn buildings would be used for the carpenter, blacksmith, electric, and plumbing shop. The stockyards would no longer need the buildings and the area leased west of North Main Street for those purposes.

Present and proposed utilization of labor

The total estimated labor required of the stockyards for operating the cattle division with proposed facilities and operations is 199,656 man-hours. This is about 41 percent less

than the 336,403 man-hours used in 1955. The labor used per head for the 1,040,676 cattle handled on the market in 1955 is 0.32 man-hour. With proposed facilities and operations the estimated labor required is 0.19 man-hour.

Total estimated labor in the cattle division with proposed facilities and operations would be reduced by 136,747 man-hours annually. Total saving in labor to both the stockyards and commission firms is estimated at 166,232 man-hours annually.

Utilization of labor by operating cycles is shown in table 34. The labor estimated with proposed facilities and operations is less for all operating cycles except one—loading out cattle by trucks. This increase is caused by the proposed operations, which provides for more services to buyers.

Utilization of labor in the cattle division, by day of week, is shown in table 35. The amount of labor required each day of the week is reduced with improved facilities and operations, the reductions ranging from 28 percent on Saturday to 47 percent on Thursday.

TABLE 34.—*Cattle division: Comparison of present and proposed utilization of labor by operating cycles*

Operating cycle	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Receiving cattle by truck	81,472	50,901	30,571	37.5
Receiving and shipping cattle by rail	14,026	5,545	8,481	60.5
Weighing cattle	68,380	32,135	36,245	53.0
Keying cattle	22,692	7,904	14,788	65.2
Loading out cattle by truck	4,336	4,992	−656	15.1
Water patrolling	11,668	2,746	8,922	76.5
Fire patrolling	5,402	2,392	3,010	55.7
Cleaning	29,139	20,384	8,755	30.0
Feeding livestock	41,405	26,591	14,814	35.8
Maintenance	32,729	21,631	11,098	33.9
Watchman service	25,154	14,642	10,512	41.8
Labor pool	0	9,793	−9,793	....
Total	336,403	199,656	136,747	40.6

Hog and Sheep Division

Receiving Hogs and Sheep by Truck

Present facilities

A truck approach, truck dock, sales and packer pens, and two small buildings are the major facilities used in receiving hogs and sheep arriving by truck.

The approach to the truck dock is 240 feet wide and 140 feet deep with a gravel surface. It serves both the hog and sheep truck docks and provides adequate space for large and small trucks to turn and back to the docks. Some of the space is used for parking vehicles.

A dock with 10 chutes is used for receiving hogs. Six chutes are used for receiving hogs arriving on both large and small trucks with single decks. These chutes, including the chute pens, are 20 by 20 feet, the platform is 4 feet wide, and the chute pen is 16 by 20 feet. Four chutes are used for receiving hogs from large trucks with double decks. These chutes have no platforms and the chute pens are 20 by 30 feet. They are designed for receiving large and small lots efficiently.

TABLE 35.—*Cattle division: Present and proposed utilization of labor, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	65,834	38,473	27,361	41.6
Tuesday	64,945	39,837	25,108	38.7
Wednesday	61,954	36,175	25,779	41.6
Thursday	57,364	30,171	27,193	47.4
Friday	41,881	25,840	16,041	38.3
Saturday	16,158	11,611	4,547	28.1
Sunday	28,267	17,549	10,718	37.9
Total	336,403	199,656	136,747	40.6

Seven double-deck and 1 single-deck chutes are used for receiving sheep. The 7 double-deck chutes are 20 by 40 feet and the single-deck chute is 20 by 30 feet. All are well designed to unload and load sheep.

The chute house is a two-story structure about 20 by 40 feet. The first floor is used for a restaurant and the second as a company office for clerical workers.

Truck-receiving workload

In 1955, a total of 22,094 consignments of hogs were received, and 17,608 consignments of sheep. The average number of hogs per consignment was 25 and the average number of sheep was 59. Wide variations were common. The problem of identifying animals in each consignment necessitates each consignment being handled separately, regardless of its size.

The labor load is uneven because receipts vary by seasons, by days, by shifts, and by hours of day.

Receipts of sheep are highly seasonal. Almost 75 percent of the annual volume is received between the first of May and the middle of June, although receipts may be expected almost every day of the year. Hog receipts are more evenly distributed.

The number of consignments of hogs and sheep arriving at the market varies among the 3 work shifts. Roughly, 35 percent of both hog and sheep consignments are received on the first shift, 35 percent on the second shift, and 30 percent on the third shift. However, hog and sheep consignments tend to crowd the last part of the third and the first part of the first shifts. Consignments are more evenly distributed on the second shift.

The number of hog and sheep consignments arriving on the market varies by day of week. A large number arrive on Monday, Tuesday, Wednesday, and Thursday. The number drops drastically on Friday and Saturday. Table 36 shows the number of consignments and animals arriving daily in 1955. The number of consignments of hogs arriving by hours of the day and day of the week varies widely. Heavy consignments may be expected from about 5 a. m. to 10 a. m., Monday through Wednesday. The number of consignments is light Thursday through Sunday, and between 10 a. m. and 5 a. m. on other days. Because sheep receipts are highly seasonal, on peak volume days heavy arrivals may be expected at any hour. During other periods they are sporadic. Generally, the heaviest arrivals may be expected during early morning hours.

The same labor policy as in the cattle division with respect to the 8-hour day and 40-hour week prevails. Work crews are established at both the hog and sheep truck docks. As complete labor records for each job for each species were not available, labor utilization for each job is based on the total for both by shifts, by days, and by seasons. Unlike workers in the cattle division, workers receiving hogs and sheep may perform two or more jobs. For illustration, the checkers, in addition to checking in hogs and sheep, may also do the counting and driving. Furthermore, workers on specific jobs may alternate between the hog and sheep truck docks. Workers of the stockyards perform all receiving jobs and are supervised by a foreman.

CLERKING.—One worker does the clerking for both hogs and sheep arriving by trucks. The worker reviews waybills for completeness, maintains a running record of hog and sheep receipts, and delivers waybills to the general office at specified intervals. He also prepares feed tickets for market hogs, records feeding activities, and orders feed for sheep.

This job is performed 24 hours every day. From 3 p. m. on Friday until 3 p. m. on Sunday, however, and from 3 p. m. to 11 p. m. Monday through Thursday, the clerking and checking jobs are combined. This means that clerking is a full-time job only 5 days a week, and on two shifts—the first and the third. When clerking and checking are combined, half of the worker's time is charged to clerking and the other half to checking. Clerks had no trouble keeping abreast of their work on any shift. In 1955, the labor used for clerking amounted to 6,218 man-hours. Of the total, 40 percent was used on the first shift, 20 percent on the second shift, and 40 percent on the third shift.

TABLE 36.—*Receiving hogs and sheep by truck: Consignments and hogs and sheep, by day of the week*

Day	Consignments		Head	
Hogs:	*Number*	*Percent*	*Number*	*Percent*
Monday	3,804	17.3	58,875	10.6
Tuesday	5,613	25.4	109,910	19.9
Wednesday	4,403	19.9	129,028	23.4
Thursday	2,920	13.2	92,409	16.7
Friday	696	3.1	36,428	6.7
Saturday	1,214	5.5	63.185	11.4
Sunday	3,444	15.6	62,371	11.3
Total	22,094	100.0	552,206	100.0
Sheep:				
Monday	2,717	15.3	97,438	9.4
Tuesday	5,040	28.5	241,028	23.3
Wednesday	3,799	21.5	227,854	21.9
Thursday	1,914	10.8	143,617	13.8
Friday	451	2.6	47,996	4.6
Saturday	774	4.4	93,509	9.0
Sunday	2,993	16.9	186,876	18.0
Total	17,688	100.0	1,038,318	100.0
Total:				
Monday	6,521	16.4	156,313	9.8
Tuesday	10,653	26.8	350,938	22.1
Wednesday	8,202	20.6	356,882	22.4
Thursday	4,834	12.1	236,026	14.8
Friday	1,147	2.9	84,424	5.3
Saturday	1,988	5.0	156,694	9.9
Sunday	6,437	16.2	249,247	15.7
Total	39,782	100.0	1,590,524	100.0

CHECKING.—Checking usually includes counting and driving (fig. 28). Only one worker is regularly assigned to driving. He is assigned to the hog truck dock on the third shift. On other shifts, when receipts are heavy, workers may be assigned to counting and driving for short periods. Basically, the same jobs are performed in checking both hogs and sheep.

Checkers receive the waybill from the shipper and review it for completeness, unlock the gate to the chute pen, and check the count against the number recorded on the waybill (fig. 29). The chute pen number, the time, and checker's name are recorded on the waybill. Animals are counted and driven out of the chute pen to a holding pen in the yards and counted into the pen. Checkers lock the gate to the holding pen, record the holding pen number on the waybill, deliver the waybill to

BN–6102

Figure 28.—A checker driving hogs from a truck at the truck dock.

BN–6103

Figure 29.—A checker unlocking a gate to a chute pen at the hog truck docks. Gates to all chute pens at the Fort Worth Stockyards are locked except when livestock is being unloaded.

the clerk's waybill box, and feed market hogs on request.

The number of workers checking hogs and sheep into the market varies widely by hours of the day, days of the week, and seasons. When receipts are heavy, as many as 4 or 5 checkers may be on duty for short periods. At other times, only two checkers may be on duty. At least 1 checker is on duty at all times. Usually only one checker is at the hog truck dock. The others are at the sheep truck dock (fig. 30).

One worker was observed to check in 44 consignments of market hogs in 2 hours. The average elapsed time per consignment was 2.7 minutes. This worker did not drive the hogs. The 2-hour period represented the peak load for the day. After that period, one worker could easily check, count, and drive all consignments received during that shift. The time required for driving consignments of hogs ranged from about 1 to 3 minutes. Sales pens for hogs are close to the truck docks and the drives are short.

Sheep checking is different from hog checking. Hogs are counted off the truck, but sheep are not counted until they are in the chute pen or on their way out of it. As a result, a checker may take a waybill from one shipper, check it, and unlock the chute pen gate for the shipper to unload, then do the same for one or more shippers, especially during periods of peak receipts. Driving sheep from the truck into the chute pen may be difficult and time-consuming. As a rule, the checker drives the first consignment from the chute pen to holding pens in the yards while later consignments are being unloaded. This is the most efficient method of receiving sheep.

The checker counts the sheep out of the chute pen and drives them to the holding pen (fig.

BN–6104

Figure 30.—A checker waiting for the shipper to drive sheep from his truck.

31). One worker checked 11 consignments of sheep into the market in an hour, but the checking time for individual consignments varied widely. Sheep must sometimes be driven a long way from truck docks to sales pens.

In 1955, the total labor used for checking hogs and sheep amounted to 17,958 man-hours. About 23 percent of the labor was used for checking on the first shift, 32 percent on the second shift, and 44 percent on the third shift.

BN–0105

Figure 31.—Driving a small lot of sheep to sales pens.

COUNTING AND DRIVING.—When counting and driving are performed, they are usually for receiving hogs rather than sheep. A regular worker is used for driving on the second shift. On other shifts, workers are assigned from other crews. In 1955, a total of 5,470 man-hours was used for counting and driving consignments of hogs and sheep. Twenty-one percent of the labor was used on the first shift, 25 percent on the second, and 54 percent on the third shift.

Summary of present labor utilization

In 1955, the stockyards used 29,646 man-hours, an average of 0.8 man-hour per consignment, for receiving hogs and sheep arriving by trucks.

The labor used for specific jobs by shifts is shown in table 37. Checking required 60 percent of the labor; checking involves other duties. Clerking labor amounted to 21 percent of the total. Only one-half the clerk's time on the second shift is charged to clerking. The labor for counting and driving comprised 19 percent of the total.

The amount of labor used varies considerably among shifts. Forty-five percent of the total was used on the third shift, 29 percent on the second shift, and 26 percent on the first shift. On the third shift, the labor per consignment was 1.2 man-hours, which is double the amount used on either the first or the second shift. The indications are that the labor load is out of line with the workload on the third shift.

TABLE 37.—*Receiving hogs and sheep by trucks: Labor utilization by jobs and shifts in 1955*

Job	7 a.m. to 3 p.m.	3 p.m. to 11 p.m.	11 p.m. to 7 a.m.	Total
	Man-hours	*Man-hours*	*Man-hours*	*Man-hours*
Clerking	2,529	1,196	2,493	6,218
Checking	4,118	5,877	7,963	17,958
Counting	1,069	133	822	2,024
Driving	78	1,216	2,152	3,446
Total	7,794	8,422	13,430	29,646
Percent	26.3	28.4	45.3	100.8
Labor per consignment	.5	.6	1.2	.0

The labor used in receiving consignments of hogs and sheep varies by days of the week. About 19 percent of the labor is used on Monday, 19 percent on Tuesday, 17 percent on Wednesday, 15 percent on Thursday, 8 percent on Friday, 6 percent on Saturday, and 16 percent on Sunday.

Facilities proposed

Facilities for receiving hogs and sheep should be relocated and rearranged. It is suggested that the truck approach and the docks be located on the west side of the market. The truck approach should be about 370 feet wide and 115 feet deep. The suggested location might mean the tearing down of a well-constructed building. If this is considered impractical, another location for the truck dock which would provide the proper flow of livestock in the division, at reasonable cost, may be difficult to obtain.

A truck dock with 10 chutes is suggested for hogs—6 for trucks with single-deck loads and 4 for trucks with double-deck loads. Each of the six truck chutes would be 18 feet wide and 26 feet deep, including the platforms and chute pens. The platform would be 3 feet wide and the chute pens 18 by 23 feet. The four chutes for double-deck trucks would be 18 by 42 feet. The docks and chute pens for receiving hogs should contain 5,780 square feet of space.

Nine double-deck truck chutes, each 18 by 42 feet, are suggested for receiving sheep by large trucks. One single-deck chute, 16 by 42 feet, is suggested for receiving sheep by small trucks. The chutes and chute pens comprise 7,476 square feet.

No building would be needed for a clerk office or restaurant but a small shelter house should be provided.

Proposed operations and labor utilization

CLERKING.—(See Clerking, Cattle Division.)

The clerking for hogs and sheep arriving by truck accounts for 26 percent of the total clerk-

ing workload. It is estimated that 2,271 man-hours from central clerking labor force would be needed for this job.

CHECKING.—Because the workload for hogs and sheep varies widely, any organization for checking consignments of hogs and sheep into the market has to be flexible. Labor has to be available at all times, regardless of size of workload. Table 80 shows an assumed work schedule for workers checking hogs and sheep. The labor, which is scheduled to coincide with the workload variations, should meet individual peak and slack periods as they occur.

The proposed schedule provides for a total of 346 man-hours weekly, or 17,992 man-hours annually. This is 34 man-hours more than were used in 1955. As proposed, 1,865 man-hours would be used for receiving and shipping by rail and for weighing direct hogs and sheep. This leaves a total of 16,127 man-hours to be used for checking hogs and sheep at the truck docks. About 5,369 man-hours would be used on the first shift, 4,880 on the second, and 5,878 on the third.

COUNTING.—It is proposed that checkers do the counting and that the separate job of counting be abolished. This would result in a saving of the 2,204 man-hours used for counting in 1955.

DRIVING.—Checking workers do most of the driving, usually in the early morning, the period of peak hog arrivals. Table 80 shows a work schedule for a full-time hog driver. This schedule is based on the 1955 workload and covers the period of peak receipts from 3 a. m. to 11 a. m. The labor proposed amounts to 2,080 man-hours annually, 50 percent to be used on the first shift and 50 percent on the third shift.

Summary of proposed labor utilization

The labor proposed for receiving hogs and sheep by truck with improved facilities and operations is 20,478 man-hours annually, or 0.52 man-hour per consignment.

Eleven percent of the total labor proposed is for clerking, 79 percent for checking, and 10 percent for driving. The amount of labor proposed by jobs on the various shifts is shown in table 38, with 35 percent of the total suggested for the first shift, 27 percent for the second shift, and 38 percent for the third shift.

The amount of labor proposed varies by days of the week. About 18 percent of the total labor is proposed for Monday, 18 percent for Tuesday, 16 percent for Wednesday, 13 percent for Thursday, 12 percent for Friday, 11 percent for Saturday, and 12 percent for Sunday.

Comparison of present and proposed labor utilization

The estimated labor required for receiving hogs and sheep by trucks with proposed facilities and operations is 20,478 man-hours annually, or about 31 percent less than the 29,646 man-hours used in 1955. The estimated labor per consignment is 0.52 man-hour, as compared to 0.75 man-hour in 1955.

The estimated labor for all jobs in the receiving of hogs and sheep by trucks is less than that used in 1955 (table 39). Clerking is reduced 60 percent, checking 10 percent, and driving 41 percent. Counting would be eliminated.

TABLE 38.—*Receiving hogs and sheep by trucks: Proposed labor utilization by jobs and shifts*

Job	7 a.m. to 3 p.m.	3 p.m. to 11 p.m.	11 p.m. to 7 a.m.	Total
	Man-hours	*Man-hours*	*Man-hours*	*Man-hours*
Clerking	757	757	757	2,271
Checking	5,369	4,880	5,878	16,127
Counting	0	0	0	0
Driving	1,040	0	0	0
Total	7,166	5,637	7,675	20,478
Labor used per consignment	.51	.40	.66	.52

TABLE 39.—*Receiving hogs and sheep by trucks: Present and proposed labor utilization by jobs and shifts*

Job	7 a.m. to 3 p.m.	3 p.m. to 11 p.m.	11 p.m. to 7 a.m.	Total
	Man-hours	*Man-hours*	*Man-hours*	*Man-hours*
Present facilities and operations:				
Clerking	2,529	1,196	2,493	6,218
Checking	4,118	5,877	7,963	17,958
Counting	1,069	133	822	2,024
Driving	78	1,216	2,152	3,446
Total	7,794	8,422	13,430	29,646
Labor used per consignment	.56	.59	1.16	.75
Proposed facilities and operations:				
Clerking	757	757	757	2,271
Checking	5,369	4,880	5,878	16,127
Counting	0	0	0	0
Driving	1,040	0	1,040	2,080
Total	7,166	5,637	7,678	20,478
Labor used per consignment	.51	.40	.66	.52
Benefits from proposed facilities and operations:				
Clerking	1,772	439	1,736	3,947
Checking	−1,251	997	2,085	1,831
Counting	1,069	133	822	2,024
Driving	962	1,216	1,112	1,366
Total	628	2,785	5,755	9,168
Labor per consignment	.05	.19	.50	.23

The amount of labor proposed for receiving hogs and sheep with improved facilities and operations is less than that used in 1955 for each day of the week except Saturday (table 40). The larger amount proposed for Saturday results from a division of labor between truck and rail receiving. The same labor force would handle both jobs.

Receiving and Shipping Hogs and Sheep by Rail

Present facilities

A rail dock with 25 chute pens, 18 shipping pens, and an office are the major facilities used. The rail dock is 1,037 feet long. The chute pens are about 16 by 40 feet, with a total area of 15,888 square feet. The 18 shipping pens contain 14,240 square feet, enough space for about 2,370 sheep. Nine of the shipping pens are 20 by 30 feet, and 9 are 20 by 50 feet. Shipping pens are used primarily for sheep; after the sheep season they are used as packer pens.

The rail dock is divided into two sections, 1 for hogs and 1 for sheep, because the market is operating under the provisions of a quarantine, no longer in effect. Hogs are loaded and unloaded at 8 chute pens at the north end and 1 at the south, where the immunization facilities are located. Sheep are received and shipped at 16 chute pens at the south end.

TABLE 40.—*Receiving hogs and sheep by trucks: Comparison of present and proposed utilization, by day of the week*

Day	Labor			
	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	5,743	3,645	2,098	36.5
Tuesday	5,682	3,645	2,037	35.8
Wednesday	4,859	3,338	1,521	31.3
Thursday	4,495	2,580	1,915	42.6
Friday	2,500	2,396	104	4.2
Saturday	1,622	2,191	−569	35.1
Sunday	4,745	2,683	2,062	43.5
Total	29,646	20,478	9,168	30.9

Receiving and shipping workload

In 1955, rail receipts and rail load-outs consisted of 3,173 cars containing 420,394 hogs and sheep. Receipts totaled 1,845 cars, with 198,460 hogs and sheep. Sixty-six percent, or 1,217 cars, of the rail receipts were loaded with 99,530 hogs; and 34 percent, or 817 cars, were loaded with 98,876 sheep. Sheep accounted for practically all rail load-outs. The number of cars loaded out was 1,328. Of this number 1,326 were loaded with 221,988 sheep. In addition, two cars with 82 hogs were loaded.

The workload is heavy on the first and second shifts. Forty-two percent, or 1,321 rail cars, were either received or loaded out on the first shift, and 49 percent, or 1,562 cars, on the second. Only 9 percent, or 290 rail cars, were handled on the third shift, an average of less than 1 a day throughout the year.

An average of 61 rail cars per week was received or loaded out in 1955. Wide departures from the average were common. Rail receipts and load-outs were heavy on Monday, Tuesday, Wednesday, and Thursday, and light on Friday, Saturday, and Sunday.

The workloads for rail receipts and load-outs are concentrated on the first and second shifts of the first 4 days of the week but are unpredictable. Some days nothing is handled by rail. Table 41 shows the number of daily rail car receipts and load-outs of hogs and sheep.

Operations and labor utilization

Practically the same operations used in receiving and loading cattle are used for hogs and sheep. Clerking and checking at the hog and sheep rail dock are combined and a crew of workers is set up to perform the jobs. Workers for other jobs are assembled from other crews in the yards as needed. The work day is divided into the 3 standard work shifts.

CLERKING-CHECKING. — The clerking-checking job is performed 24 hours a day, 7 days a week, at the hog and sheep rail dock. One worker does the job on each shift. Duties in clerking and checking at the hog and sheep rail dock, although similar to those at the cattle rail dock, include several other jobs, primarily clerical. These are preparing a report on the amount of feed fed to market and direct hogs, maintaining records on the number of hogs and sheep dipped, and preparing a report on feed orders fed. All these jobs, while important, require little time. The time the worker devotes to each job is charged to that particular job. No observations were noted where the worker failed to keep abreast of the workload.

In 1955, a total of 1,590 man-hours was used for the clerking-checking job. It is estimated that 37 percent of the labor was used for clerking and 63 percent for checking.

LOADING, UNLOADING, COUNTING, AND DRIVING.—In the same manner as at the cattle rail dock, workers are assembled from other crews as needed to load, unload, count, and drive sheep and hogs. The work is usually soon finished and workers are returned to other crews. A considerable part of the time charged to these jobs is spent walking to and from the hog and sheep rail dock. Workload does not merit maintenance of a regular crew.

TABLE 41.—*Receiving and shipping hogs and sheep by rail: Cars and animals handled, by species, by day of the week*

Day	Hogs				Sheep				Total			
	Rail cars		Hogs		Rail cars		Sheep		Rail cars		Hogs and sheep	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Receipts:												
Monday	38	3.2	2,440	2.5	238	12.2	34,362	10.7	276	8.7	36,802	8.8
Tuesday	0	0	0	0	63	3.2	6,960	2.2	63	2.0	6,960	1.6
Wednesday	209	17.2	17,630	17.7	38	1.9	7,874	2.5	247	7.8	25,504	6.1
Thursday	247	20.3	20,261	20.4	38	1.9	6,534	2.0	285	9.0	26,795	6.4
Friday	228	18.7	17,440	17.5	100	5.1	16,373	5.1	328	10.3	33,813	8.0
Saturday	362	29.7	30,456	30.6	13	.7	3,217	1.0	375	11.8	33,673	8.0
Sunday	133	10.9	11,303	11.3	138	7.1	23,556	7.4	271	8.5	34,859	8.3
Subtotal	1,217	100.0	99,530	100.0	628	32.1	98,876	30.9	1,845	58.1	198,406	47.2
Shipments:												
Monday	2	0	82	0	286	14.6	48,919	15.3	288	9.1	49,001	11.7
Tuesday	0	0	0	0	468	24.0	68,900	21.4	468	14.8	68,900	16.4
Wednesday	0	0	0	0	273	14.0	52,780	16.4	273	8.6	52,780	12.5
Thursday	0	0	0	0	247	12.6	37,323	11.7	247	7.8	37,323	8.9
Friday	0	0	0	0	39	2.0	10,725	3.3	39	1.2	10,725	2.5
Saturday	0	0	0	0	13	.7	3,341	1.0	13	.4	3,341	.8
Sunday	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	2	0	82	0	1,326	67.9	221,988	69.1	1,328	41.9	222,070	52.8
Total receipts and shipments:												
Monday	40	3.2	2,522	2.5	524	26.8	83,281	26.0	564	17.8	85,803	20.5
Tuesday	0	0	0	0	531	27.2	75,860	23.6	531	16.8	75,860	18.0
Wednesday	209	17.2	17,630	17.7	311	15.9	60,654	18.9	520	16.4	78,284	18.6
Thursday	247	20.3	20,261	20.4	285	14.5	43,857	13.7	532	16.8	64,118	15.3
Friday	228	18.7	17,440	17.5	139	7.1	27,098	8.4	367	11.5	44,538	10.5
Saturday	362	29.7	30,456	30.6	26	1.4	6,558	2.0	388	12.2	37,014	8.8
Sunday	133	10.9	11,303	11.3	138	7.1	23,556	7.4	271	8.5	34,859	8.3
Total	1,219	100.0	99,612	100.0	1,954	100.0	320,864	100.0	3,173	100.0	420,476	100.0

In 1955, an average of 1.1 man-hours per car was used for these physical handling operations. The total labor amounted to 3,342 man-hours.

BEDDING CARS.—Cars are bedded in the same manner as at the cattle rail dock. Necessary labor comes from other work crews. In 1955, 27 man-hours were used for bedding cars.

AWAITING ORDERS.—In 1955, 88 man-hours were charged for awaiting orders.

Summary of labor utilization

Total labor used for receiving hogs and sheep in 1955 was 5,047 man-hours. The average amount of labor used per car was 1.6 man-hours.

Labor used for specific jobs in receiving and loading out rail cars of hogs and sheep is shown in table 42. About 31 percent of the total labor is used for clerking and checking, 25 percent for unloading and loading, 12 percent for counting, and 29 percent for driving. Bedding cars accounted for less than 1 percent of the labor and awaiting orders accounted for about 2 percent.

The amount of labor used varied widely by day of the week. Twenty-four percent of the labor was used on Monday, 11 percent on Tuesday, 20 percent on Wednesday, 17 percent on Thursday, 17 percent on Friday, 8 percent on Saturday, and 3 percent on Sunday.

Facilities proposed

With the exception of one pen at the south end of the rail dock—where a corn elevator is proposed—the rail docks and chute pens would be the same as in 1955. Relocation of the ship-

TABLE 42.—*Receiving and shipping hogs and sheep by rail: labor utilization, by jobs.*

Type of job	Labor	
	Man-hours	*Percent*
Clerking	590	11.7
Checking	1,000	19.8
Unloading and loading	1,265	25.1
Counting	598	11.9
Driving	1,479	29.3
Bedding cars	27	.5
Awaiting orders	88	1.7
Total	5,047	100.0

ping pens is recommended. The 20 shipping pens would contain 12,480 square feet and would hold about 2,080 sheep. They could be used as packer pens after the sheep season.

Proposed operations and labor utilization

CLERKING.—The proposed central clerking system would handle the clerking for receiving and shipping hogs and sheep by rail. Because the clerical work is estimated to be 3 percent of the total workload of the central clerking system, the proposed labor for clerking with improved facilities and methods is 175 man-hours annually.

CHECKING.—Checkers at the truck dock and workers in the proposed labor pool would check mail receipts and shipments of hogs and sheep. The estimated labor required is the same as in 1955. Provisions are made for 422 man-hours for this job, in the work schedules of the truck dock checkers, 200 man-hours from the labor pool, and 378 man-hours from workers who are scheduled part-time as weighmasters.

LOADING, UNLOADING, COUNTING, AND DRIVING.—The labor proposed for loading, unloading, counting, and driving would match the 1955 figure—3,342 man-hours. Workers would be assembled from other crews. It is estimated that 233 man-hours for these jobs would be obtained from checkers at the hog and sheep truck dock, and 640 man-hours from the proposed labor pool.

BEDDING CARS. — Labor used for bedding cars was 27 man-hours in 1955. It is estimated that the labor required for this job would remain the same and would be obtained from the proposed labor pool.

AWAITING ORDERS.—Awaiting orders (idle time), which in 1955 amounted to 88 man-hours, should be eliminated by assembling workers for unloading, loading, counting, and driving only when they are needed.

Summary of proposed utilization of labor

The total labor proposed for receiving and shipping rail cars of hogs and sheep is 4,544 man-hours, or 1.4 man-hours per car for a workload like that of 1955.

The amount of labor proposed for specific jobs is shown in table 43. Four percent of the labor would be used for clerking, 22 percent for checking, 28 percent for unloading and loading, 13 percent for counting, and 33 percent for driving. Bedding cars accounts for less than 1 percent.

Labor proposed by days of the week is distributed on the same percentage basis as labor was used in 1955. The number of man-hours proposed varies from 1,090 man-hours on Monday to 136 man-hours on Saturday.

TABLE 43.—*Receiving and shipping hogs and sheep by rail: Proposed labor utilization, by type of job*

Type of job	Labor	
	Man-hours	*Percent*
Clerking	175	3.9
Checking	1,000	22.0
Unloading and loading	1,265	27.8
Counting	598	13.2
Driving	1,479	32.5
Bedding cars	27	.6
Total	4,544	100.0

Comparison of present and proposed utilization of labor

With proposed operations and facilities, and the same workload as in 1955, the estimated labor required for receiving and shipping hogs and sheep by rail is 4,544 man-hours—about 1.4 man-hours per car. This is 503 man-hours less than the 5,047 man-hours—about 1.6 man-hours per car—used in 1955.

The estimated labor for all jobs would be the same except clerking and awaiting orders. Clerking would be reduced by 415 man-hours annually, and the 88 man-hours for awaiting orders could be eliminated by using the proposed operations (table 44).

TABLE 44.—*Receiving and shipping hogs and sheep by rail: Present and proposed utilization of labor, by jobs*

Type of job	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Clerking	590	175	415	70.3
Checking	1,000	1,000	0	0
Unloading and loading	1,265	1,265	0	0
Counting	598	598	0	0
Driving	1,479	1,479	0	0
Bedding cars	27	27	0	0
Awaiting orders	88	0	88	100.0
Total	5,047	4,544	503	10.0

The daily labor proposed for receiving and shipping hogs by rail with proposed facilities and operations is less than that used in 1955 (table 45).

Weighing Hogs and Sheep

Present facilities

Hogs and sheep are weighed on five scale blocks, each of which consists of a house, scale

platform, pockets, and purchaser pens. Because the market is operating under a previous quarantine, hogs and sheep are weighed at different scale blocks. Of the two scale blocks that are used for weighing hogs, one has a platform 11 by 16 feet and a capacity of 20,000 pounds. It also has a scale pocket and 13 purchaser pens of varying sizes. The purchaser pens contain 3,680 square feet of pen space and hold about 450 hogs. The scale block is arranged so that hogs purchased by packers may be yarded directly in packer pens with short drives. This scale block is used for weighing market hogs.

TABLE 45.—*Receiving and shipping hogs and sheep by rail: Present and proposed labor utilization, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	1,216	1,095	121	10.0
Tuesday	543	489	54	9.9
Wednesday	1,008	907	101	10.0
Thursday	838	754	84	10.0
Friday	865	779	86	9.9
Saturday	430	387	43	10.0
Sunday	147	133	14	9.5
Total	5,047	4,544	503	10.0

The other scale block used for weighing hogs has a platform 14 by 26 feet. This scale is primarily for weighing large lots of direct hogs. It has no purchaser pens because direct hogs are yarded in packer pens after weighing. The scale has a 40,000-pound capacity.

Three scale blocks are used for weighing sheep. Each of the scale platforms is 14 by 26 feet and has a capacity of 20,000 pounds. These blocks have a combined total of 65 purchaser pens which contain 45,410 square feet of pen space. They hold about 10,000 sheep. Purchaser pens for two of these scale blocks are on the second floor of the hog and sheep division. The location and arrangement of the purchaser pens in relation to the scale blocks causes long out-of-line drives, and back drives in yarding sheep after weighing. Market sheep are weighed at all 3 scale blocks, and direct sheep are weighed at any 1 of the 3.

Weighing workload

The weighing workload in the hog and sheep division, just as in the cattle division, is determined by the number of drafts rather than the number of animals. In 1955, a total of 67,652 drafts of hogs and sheep were weighed, of which 28,955 drafts were hogs; 38,697 drafts were sheep. The number of hogs was 651,911; of sheep, 1,071,568.

The workload is divided into weighing market hogs, weighing market sheep, and weighing direct hogs and sheep. Market hogs are weighed at 1 scale block, and market sheep are weighed at 3 scale blocks. Direct hogs are weighed at a separate scale block, while direct sheep are weighed at one of the scale blocks used for weighing market sheep.

The number of drafts by day of the week is shown in table 46. Market hogs weighed in 1955 totaled 19,902 drafts (118,647 hogs). The number of drafts weighed is highest on Monday, Tuesday, and Wednesday, with a sharp decline on Thursday. The workload is practically nil on Friday.

In 1955, a total of 36,331 drafts of market sheep, consisting of 867,548 head, were weighed. The average draft was 23.9 head. The weighing workload for sheep is heaviest between the first of May and the middle of June. During this period, 2 and sometimes 3 scale blocks are used. After the sheep season, the weighing workload is so light that usually one scale block can handle it in a few hours. In 1955, 11,419 direct drafts with 737,284 hogs and sheep were weighed. Approximately 79 percent—9,053 drafts—were hogs, and 21 percent—2,366 drafts—were sheep; 72 percent, or 533,264 of the animals weighed, were hogs, and 28 percent—204,020—were sheep. Direct hogs and sheep usually are weighed as they arrive on the market any hour of the day or night, any day of the week.

TABLE 46—*Weighing hogs and sheep: Drafts of market hogs, market sheep, and direct hogs and sheep weighed, by day of week, 1955*

Day	Market hogs		Market sheep		Direct hogs and sheep	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Monday	7,071	35.5	12,384	34.1	4,197	36.8
Tuesday	5,924	29.8	9,475	26.1	1,910	16.7
Wednesday	4,245	21.3	9,095	25.0	1,972	17.3
Thursday	1,952	9.8	4,529	12.5	1,219	10.7
Friday	710	3.6	848	2.3	778	6.8
Saturday	0	0	0	0	723	6.3
Sunday	0	0	0	0	620	5.4
Total	19,902	100.0	36,331	100.0	11,419	100.0

Operations and labor utilization

Hogs and sheep are weighed like cattle, and the same jobs are performed (fig. 32), with one worker generally doing each job. The work day for the crew is 8 hours, including a lunch period. There are 4 crews, each consisting of 5 workers, for the hog and sheep division. When not weighing, workers are assigned to other jobs.

BN-6106

Figure 32.—Backgateman driving hogs off scale platform and counter counting hogs as they leave the platform.

BN-6107

Figure 33.—Driver and pen catcher yarding hogs in purchaser pen after weighing.

WEIGHING MARKET HOGS.—Market hogs are weighed at one scale block which opens at 8 a. m., Monday through Friday (fig. 33). It is rarely open a full 8-hour day (table 47). The number of drafts of hogs weighed per hour is far below the number weighed at other yards. Indications are that the scale block is not closed as promptly as it should be or that labor is not shifted promptly to other jobs in the yards. However, when only one scale block is used for weighing either hogs or sheep, the fullest weighing efficiency is not realized. All of the inefficiencies in the selling operations are reflected in the operation of the one scale block.

A total of 6,288 man-hours was used for weighing market hogs in 1955. Weighmastering accounted for 2,058 man-hours; counting, 888 man-hours; backgating, 1,417 man-hours; pen catching, 888 man-hours; and driving, 1,037 man-hours. The large differences in the number of man-hours used for specific jobs indicate that the weighmaster, backgateman, and driver are not shifted promptly to other jobs in the yards when the scale block is closed.

The number of man-hours used daily varies widely; 22.5 percent of the weekly total is used on Monday, 24.2 percent on Tuesday, 21.1 percent on Wednesday, 18 percent on Thursday, and 14.2 percent on Friday.

WEIGHING MARKET SHEEP.—Most of the year only one scale block is used for weighing market sheep (fig. 34). The workload is insufficient to keep the scale block open for 8 hours. During the sheep run, three scale blocks may be used. They open at 8 a. m. and close when weighing is completed.

Indications are that scale blocks are not closed promptly when weighing is finished, and that labor is not shifted promptly to other jobs

TABLE 47.—*Weighing market hogs: Daily average number of hours scale block open, drafts weighed, labor used, drafts weighed per hour, and labor used per draft weighed*

Day	Hours scale block open	Drafts weighed	Labor used	Drafts weighed per hour	Labor used per draft weighed
	Number	*Number*	*Man-hours*	*Number*	*Man-hours*
Monday....	5	141	27	28.2	0.19
Tuesday....	5	114	29	22.8	.25
Wednesday .	4	82	25	20.5	.30
Thursday...	3	38	22	12.7	.59
Friday.....	2	14	17	7.0	1.21
Total or average	19	389	120	20.5	.31

BN-6108

Figure 34.—The backgateman driving sheep from the scale platform and the counter counting the sheep as they leave the platform.

TABLE 48.—*Weighing market sheep: Daily average number hours scale blocks open, drafts weighed, labor used, drafts weighed per hour, and labor used per draft weighed*

Day	Hours scale block open	Drafts weighed	Labor used	Drafts weighed per hour	Labor used per draft weighed
	Number	*Number*	*Man-hours*	*Number*	*Man-hours*
Monday	12	238	83	19.8	0.35
Tuesday	8	182	60	22.7	.33
Wednesday	9	175	72	19.4	.41
Thursday	5	87	47	17.4	.54
Friday	1	16	24	16.0	1.50
Total or average	35	698	286	19.9	.41

in the yards (table 48). Two full-time scale crews are assigned for weighing market sheep. Because scale blocks are improperly arranged, two of them are often open when the workload is not sufficient for one.

A total of 14,908 man-hours was used in weighing market sheep in 1955. Weighmastering required 3,286 man-hours; counting, 2,841 man-hours; backgating, 2,510 man-hours; pen catching, 2,952 man-hours; and driving, 3,319 man-hours.

The amount of labor used varies widely by day of week. Of the total, 29.1 percent was used on Monday, 21 percent on Tuesday, 25.1 percent on Wednesday, 16.4 percent on Thursday, and 8.4 percent on Friday.

WEIGHING DIRECT HOGS AND SHEEP.—Direct hogs and sheep may be weighed on arrival at any hour of the day or night any day of the week. Direct hogs arriving at night, Sunday through Thursday, may be held for weighing until 7 a.m., when a full crew reports for duty. At 8 p.m., or as soon as the weighing is completed, the scale crew is shifted to another scale block to weigh market sheep, or to other jobs on the yards.

The labor used for the jobs of backgating, counting, driving, and pen catching in weighing of direct hogs beginning at 7 a.m., Monday through Friday, was 1,668 man-hours. Labor used for these jobs in the weighing of direct sheep during the same period, and hogs and sheep at other periods, is not included in this total. Workers for these 4 jobs are obtained from other jobs in the yards, as is done in the cattle division. A total of 3,193 man-hours was used for the job of weighmastering in the weighing of direct hogs and sheep.

Summary of present utilization of labor

In 1955 the total labor used for weighing market hogs and sheep was 21,196 man-hours. The labor used per draft was 0.38. The labor used for weighing market hogs was 6,288 man-hours, or 0.31 man-hour per draft. The labor used for weighing market sheep was 14,908 man-hours or 0.41 per draft.

A total of 3,193 man-hours was used for the job of weighmastering in the weighing of direct hogs and sheep. A total of 1,668 man-hours was used for the jobs of backgating, counting, driving, and pen catching in the weighing of direct hogs from 7 a.m. to 8 a.m., Monday through Friday. Labor for performing these jobs in the weighing of directs at other hours is not included in this total.

The labor used in specific jobs in the weighing of market and direct hogs and sheep varies considerably (table 49).

Of the total labor used for weighing all groups of hogs and sheep, 25 percent was used on Monday, 22.1 percent on Tuesday, 23.2 percent on Wednesday, 16.7 percent on Thursday, 11.1 percent on Friday, and 1 percent on Saturday. Less than 1 percent was used on Sunday. Labor used Saturday and Sunday is for weighing direct hogs and sheep and is for weighmastering only.

Proposed facilities

Five scale blocks are proposed for weighing hogs and sheep. The location and arrangement of these blocks are shown in figure 43. It is

TABLE 49.—*Weighing hogs and sheep: Labor used for weighing market hogs and sheep, and direct hogs and sheep, by jobs*

Type of job	Market hogs		Market sheep		Direct hogs and sheep		Total all groups	
	Man-hours	*Percent*	*Man-hours*	*Percent*	*Man-hours*	*Percent*	*Man-hours*	*Percent*
Weighmastering	2,058	32.7	3,286	22.0	3,193	65.7	8,537	32.8
Backgating	888	14.1	2,841	19.1	[1] 386	7.9	4,115	15.8
Counting	1,417	22.5	2,510	16.8	[1] 248	5.1	4,176	16.0
Driving	888	14.1	2,952	19.8	[1] 725	14.9	4,564	17.5
Pen catching	1,037	16.6	3,319	22.3	[1] 309	6.4	4,665	17.9
Total	6,288	100.0	14,908	100.0	4,861	100.0	26,057	100.0

[1] Includes only the labor used for weighing direct hogs from 7 a. m. to 8 a. m. Monday through Friday.

proposed that four of the present scale blocks be relocated. The remaining block, which would be used for direct hogs, is the same size as the scales now used for weighing sheep.

The scale block for weighing market hogs would have a platform 8 by 16 feet and a house 16 by 22 feet. It would have 18 purchaser pens of variable size, totaling 7,168 square feet and holding about 900 hogs. The block is arranged so that, with short drives, packer hogs could be yarded directly in packer pens.

The three scale blocks for weighing sheep would have platforms 12 by 24 feet, a weighing capacity of 20,000 pounds, and houses 16 by 22 feet. These scale blocks would have 83 purchaser pens with 54,334 square feet of space, and would hold about 14,000 sheep. The arrangement of the purchaser pens allows for the yarding of sheep with short drives.

Proposed operations and labor utilization

WEIGHING MARKET HOGS.—One scale block is proposed for weighing market hogs. The proposed arrangement of the block provides for short drives in weighing and in yarding hogs in purchaser pens. The same jobs would be performed in weighing market hogs as in weighing direct hogs. The proposed scale block hours and weighing efficiency are shown in table 50.

An assumed work schedule for workers weighing market hogs is shown in table 80. The proposed labor is the same for all five jobs —728 man-hours annually. The total labor proposed for weighing market hogs is 3,640 man-hours.

WEIGHING MARKET SHEEP.—Three scale blocks are proposed for weighing sheep. Any scale block would be available to all commission firms. Furthermore, the arrangement is such that the drives of sheep to the scale blocks and to purchaser pens are comparatively short. During the peak sheep run, all three scale blocks would be used for weighing sheep. During other periods only 1 or 2 would be needed. On the average, it is estimated that two would be needed to provide the proper weighing services. The proposed hours and weighing efficiency for the two scale blocks are shown in table 51.

TABLE 50.—*Weighing market hogs: Proposed daily average number hours scale blocks open, drafts weighed, labor, drafts weighed per hour, and labor used per draft weighed*

Day	Hours scale block open	Drafts weighed[1]	Labor used	Drafts weighed per hour	Labor used per draft weighed
	Number	*Number*	*Man-hours*	*Number*	*Man-hours*
Monday	4	141	20	35.2	0.14
Tuesday	4	114	20	28.5	.18
Wednesday	3	82	15	27.3	.18
Thursday	2	38	10	19.0	.26
Friday	1	14	5	14.0	.36
Total	14	389	70	27.8	.18

[1] Daily average number of drafts weighed in 1955.

TABLE 51.—*Weighing market sheep: Proposed daily average number hours scale blocks open, drafts weighed, labor, drafts weighed per hour, and labor used per draft weighed*

Day	Hours scale block open	Drafts weighed[1]	Labor used	Drafts weighed per hour	Labor used per draft weighed
	Number	*Number*	*Man-hours*	*Number*	*Man-hours*
Monday	10	238	50	23.8	0.21
Tuesday	8	182	40	22.7	.22
Wednesday	6	175	30	29.2	.17
Thursday	3	87	15	29.0	.17
Friday	1	16	5	16.0	.31
Total or average	28	698	140	24.9	.20

[1] Daily average number of drafts weighed in 1955.

A work schedule for workers weighing market sheep is shown in table 80. The proposed labor is the same for all five jobs—1,456 man-hours annually. The total labor proposed for weighing market sheep is 7,280 man-hours annually.

WEIGHING DIRECT HOGS AND SHEEP.—One scale block is suggested for weighing direct hogs. Direct sheep would be weighed at one of the scale blocks for weighing market sheep. It is proposed that the present crew for weighing direct hogs between 7 and 8 a. m. be abolished. It appears that it serves as a reserve crew for weighing market sheep during the peak sheep run. It is proposed that workers for the third scale crew for weighing market sheep be maintained in a labor pool.

A total of 1,596 man-hours is provided for weighmastering in the weighing of direct hogs and sheep. The work schedules for truck dock checkers provide for 1,210 man-hours, and the labor pool provides the other 386 man-hours for this job. The labor for the other jobs in weighing direct hogs and sheep would be obtained in the same manner as that described for direct cattle.

Summary of proposed labor utilization

The total labor proposed for weighing all hogs and sheep is 12,516 man-hours, or 0.19 man-hour per draft. The estimated labor for weighing market hogs is 3,640 man-hours, or 0.18 man-hour per draft. The estimated labor for weighing market sheep is 7,280 man-hours, or 0.20 man-hour per draft. The labor pro-

vided for weighmastering in the weighing direct hogs and sheep is 1,596 man-hours. Direct hogs and sheep would be weighed as they arrive on the market.

The labor proposed for specific jobs in weighing market and direct hogs and sheep is shown in table 52. The proposed labor is the same for all jobs performed in weighing market hogs. It is also the same for all jobs performed in weighing market sheep. Labor is provided only for a weighmaster in the weighing of direct hogs and sheep.

52 percent less than the 26,057 man-hours used in 1955. The labor used per draft in 1955 was 0.39 man-hour.

The present and proposed labor for weighing all hogs and sheep by specific jobs is shown in table 53. The labor proposed is less for all jobs than was used in 1955. The reduction is made possible by the use of improved facilities and operations which permit one scale crew to be abolished and workers in the remaining crews to be shifted promptly to other jobs when weighing is completed. The greatest reduction of labor is in the job of weighmastering. The proposed labor for weighmastering is 56 percent less than that used in 1955. The labor for other jobs is reduced approximately 50 percent.

TABLE 52.—*Weighing hogs and sheep: Proposed labor for weighing market hogs and sheep and direct hogs and sheep, by jobs*

Type of job	Market hogs		Market sheep		Direct hogs and sheep		Total all groups	
	Man-hours	*Percent*	*Man-hours*	*Percent*	*Man-hours*	*Percent*	*Man-hours*	*Percent*
Weighmastering	728	20.0	1,456	20.0	1,596	100.0	3,780	30.4
Backgating	728	20.0	1,456	20.0	[1]0	0	2,184	17.4
Counting	728	20.0	1,456	20.0	[1]0	0	2,184	17.4
Driving	728	20.0	1,456	20.0	[1]0	0	2,184	17.4
Pen catching	728	20.0	1,456	20.0	[1]0	0	2,184	17.4
Total	3,640	100.0	7,280	100.0	1,596	100.0	12,516	100.0

[1]Labor for these jobs would be obtained from workers assigned to other jobs in tbe yards and would not be charged to the weighing operation.

The amount of labor proposed for weighing all hogs and sheep varies widely by day of the week. Of the 12,516 man-hours proposed, 31 percent would be used on Monday, 27.4 percent on Tuesday, 21.2 percent on Wednesday, 12.7 percent on Thursday, 5.7 percent on Friday, 1.1 percent on Saturday, and less than 1 percent on Sunday. The labor proposed for Saturday and Sunday is for weighing direct hogs and sheep.

Comparison of present and proposed utilization of labor

The total estimated labor for weighing all hogs and sheep with proposed facilities and operations is 12,516 man-hours. The estimated labor per draft is 0.19 man-hour. This is about

TABLE 53.—*Weighing all hogs and sheep: Comparison of present and proposed labor utilization, by job*

Job	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Weighmastering	8,537	3,780	4,757	55.7
Counting	4,115	2,184	1,931	46.9
Backgating	4,176	2,184	1,992	47.7
Driving	4,665	2,184	2,481	53.2
Pen catching	4,564	2,184	2,380	52.1
Total	26,057	12,516	13,541	52.0

The labor for weighing all hogs and sheep with present facilities and operations as compared with the estimated labor with proposed facilities and operations by day of the week is shown in table 54. The estimated labor is less with proposed facilities and operations for each day of the week. A 40-percent reduction in labor is effected on Monday and Tuesday, 56 percent on Wednesday, 64 percent on Thursday, and 75 percent on Friday. Direct weighing labor is reduced by 50 percent on Saturday and Sunday.

Keying Hogs and Sheep

Present facilities

Facilities involved in keying hogs and sheep include the purchaser pens with each of the scale blocks and the holding pens in this division of the yards.

Keying workload

The keying workers make turn-outs ranging in size from one to several hundred animals. The workload varies widely from day to day, but is closely related to total receipts of hogs and sheep. No data were obtained on the number of pens of hogs and sheep turned out daily.

Operations and labor utilization

Hogs and sheep are keyed like cattle, but the

TABLE 54.—*Weighing all hogs and sheep: Comparison of present and proposed utilization of labor, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	6,508	3,874	2,634	40.5
Tuesday	5,750	3,430	2,320	40.3
Wednesday	6,053	2,665	3,388	56.0
Thursday	4,361	1,585	2,776	63.7
Friday	2,893	716	2,177	75.2
Saturday	280	140	140	50.0
Sunday	212	106	106	50.0
Total	26,057	12,516	13,541	52.0

workers are assigned specific functions. These include packer keying, keying market hogs and sheep, outside keying, and keying at large.

Packer keying consists of turning out hogs and sheep for packers. Two workers are assigned to this job—one for each of the two major packers. One of these men works from 7 a. m. to 3 p. m., and the other from 6 a. m. to 2 p. m., Monday through Friday. Pens in which packer animals are yarded, and from which they are eventually turned out, are scattered widely throughout the hog and sheep division. A large portion of the keyman's productive time is spent walking from the area of one turn-out to the next. Time required to unlock the pen gate, count the animals out of the pen, and record the count is comparatively small.

In one observation a worker keying packer hogs and sheep for 4 hours was productive 57 percent of the time and idle 43 percent.

During productive time, the worker turned 1,033 hogs out of 14 pens and 759 sheep out of 14 pens. The worker also unlocked gates to several pens for packer employees to sort animals, and assisted in handling a lot of direct animals. The time required for turn-outs ranged from 1 to 3 minutes and varied with the size of the lot. Lots ranged from 13 to 278 head of hogs and from 3 to 195 head of sheep. In 1955, 5,082 man-hours were used for keying packer hogs and sheep.

Keying market hogs and sheep consists of making turn-outs to purchasers other than packers. One keyman is assigned to the job from 5 a. m. to 1 p. m., Monday through Friday. In addition to keying, the worker feeds market hogs and assists in yarding hogs and sheep from truck docks. He also drives hogs to the vaccinating area, yards sprayed hogs in shipping pens, and does any other assignment received from the foreman. These jobs usually are short and infrequent, and the workload is light. The keying workload is comparatively light also, because practically all the hogs and most of the sheep are turned out to packers. In 1955, keying market hogs and sheep required 260 man-hours.

The outside keyman works from 9 a. m. to 5 p. m., Monday through Friday. In 1955, 2,496 man-hours were used for outside keying.

Keying at large is done only on Saturday and Sunday, and no regular worker or hours of work are assigned for the job. It consists primarily of making turnouts throughout the hog and sheep division. In 1955, 416 man-hours were used for keying at large. The workload for all of the four keying jobs is fairly light. The labor used, by specific keying jobs, is shown in table 55.

TABLE 55.—*Keying hogs and sheep: Labor utilization, by jobs*

Job	Labor	
	Man-hours	*Percent*
Packer keying	5,082	61.5
Keying market hogs and sheep	260	3.2
Outside keying	2,496	30.2
Keying at large	416	5.1
Total	8,254	100.0

The labor used for keying is fairly constant during the week, but rather small on weekends.

Proposed facilities

The proposed facilities for keying hogs and sheep are the purchaser pens and holding pens previously described, and arranged as shown in figure 43.

Proposed operations and labor utilization

The proposed operations for keying are the same with improved facilities as with 1955 facilities; but the more compact arrangement of the improved facilities should mean less walking for workers going to and from pens. Workers should be able to make more turn-outs with less effort and service more groups than with present facilities.

Each worker should be assigned to all keying functions. The jobs of feeding market hogs and sheep, driving hogs and sheep from the truck docks to pens in the yard or from pens to the vaccinating area, and other miscellaneous jobs now assigned to keying workers should be done by other workers.

Based on these suggestions, two workers are proposed for the keying operation. A work schedule for keying workers is shown in table 80 of the appendix. The work schedule provides for 88 man-hours weekly—16 hours a day, Monday through Friday, and 8 hours on Saturday.

Comparison of present and proposed labor utilization

Estimated labor for keying hogs and sheep with proposed facilities and operations is about 45 percent less than in 1955. It is less for each day of the week (table 56).

TABLE 56.—*Keying hogs and sheep: Comparison of present and proposed labor utilization, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	1,661	832	829	49.9
Tuesday	1,628	832	796	48.9
Wednesday	1,582	832	750	47.4
Thursday	1,563	832	731	46.8
Friday	1,404	832	572	40.7
Saturday	416	416	0	0
Sunday	0	0	0	0
Total	8,254	4,576	3,678	44.6

Water Patrolling

Present facilities

Facilities involved in water patrolling include the water hydrants and water troughs in pens throughout the hog and sheep division.

Water patrolling workload

Although employees of commission firms, dealers, and packers do some watering, the water patrolmen of the stockyards do some of it. Water patrolmen often have to close hydrant valves to prevent waste. Neglected water hydrants are not as serious a problem in the hog and sheep division as they are in the cattle division.

The workload is highly erratic, but it increases as the number of hogs and sheep received increases. Regardless of the volume, it is fairly light most of the time.

Operations and labor utilization

Water patrolling involves patrolling the yard, taking care of open water hydrants, and watering hogs and sheep upon request.

Water patrolling is done 24 hours every day. The work day is divided into three standard 8-hour shifts, each shift including a lunch period. One worker in the hog and sheep division is regularly assigned to water patrolling on the first shift, Monday through Friday. Cattle division workers patrol both the cattle and the hog and sheep divisions on the first shift on Saturday and Sunday, and the second and third shifts every day.

All observations of water patrolling during periods of both heavy and light workloads on the second and third shifts indicated that workers could be assigned other jobs without interfering with their efficiency in water patrolling, especially after they have made the first tour of the yards.

The workload at night and over the weekend is light. The receiving crew could easily water the animals during these periods. However, the amount of water patrolling necessary at any time will depend to a large extent on the cooperation of the agencies operating on the market.

The labor used for water patrolling in the hog and sheep division in 1955 amounted to 4,181 man-hours. Seventy-four percent of the labor was used on the first shift, 13 percent on the second shift, and 13 percent on the third shift. The labor is fairly constant Monday through Friday. A sharp decline occurs on Saturday and Sunday.

Proposed facilities

Proposed facilities are the same as those used in 1955, but the pen area would be more compact, making it easier for water patrolling workers to make their tours of the yards.

Proposed operations and labor utilization

The present job of water patrolling on the first shift from Monday through Friday should be maintained. The water patroller assigned to the cattle division would continue to work in both divisions of the yard on Saturday and Sunday, with 20 percent of his labor charged to the hog and sheep division on these 2 days. Other yard workers assigned to the hog and sheep division should do any necessary water patrolling on the second and third shifts.

Table 80 shows the schedule for workers water patrolling. A total of 2,246 man-hours is provided annually for water patrolling in the hog and sheep division. The labor proposed is constant from Monday to Friday.

Comparison of present and proposed labor utilization

Estimated labor for water patrolling in the hog and sheep division with improved facilities and operations is about 46 percent less than used in 1955 (table 57). The labor proposed is less for each day of the week than that used in 1955.

Fire Patrolling

Present facilities

All facilities in the hog and sheep division are involved in fire patrolling.

Fire patrolling workload

There is no established workload for fire patrolling.

Operations and labor utilization

Fire patrolling in the hog and sheep division is similar to that described in the cattle

TABLE 57.—*Water patrolling the hog and sheep division: Comparison of present and proposed labor utilization, by day of week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	760	416	344	45.3
Tuesday	650	416	234	36.0
Wednesday	728	416	312	42.9
Thursday	738	416	322	43.6
Friday	598	416	182	30.4
Saturday	395	83	312	79.0
Sunday	312	83	229	73.4
Total	4,181	2,246	1,935	46.3

division. The job is performed by weighmasters, usually in their respective scale block areas, to complete their work day when scales are closed. Occasionally, a worker other than a weighmaster is assigned to the job. The hours of fire patrollers vary from day to day. Fire patrolling by weighmasters usually is performed Monday through Friday.

The fire patroller on Saturday and Sunday is usually not a weighmaster, and he is usually assigned to the job for a full 8-hour shift on these days. Generally, this worker patrols both the cattle and the hog and sheep divisions from 7 a. m. to 3 p. m.

In 1955, fire patrolling in the hog and sheep division required 1,071 man-hours. The amount of labor used varied widely by days of the week.

Proposed facilities

No new facilities are proposed.

Proposed operations and labor utilization

Fire patrolling would be performed in the hog and sheep division in the same manner as in 1955. The amount of labor which should be provided is difficult to determine. Table 80 in the appendix shows a schedule providing for 4 man-hours daily, Monday through Friday, or 1,040 man-hours annually. This is about the same amount of labor that was used in 1955. Should additional labor be needed. it probably would be for short periods and could be obtained from the labor pool. It is suggested that the worker regularly assigned to fire patrolling cover the hog and sheep division on Saturday and Sunday. It also is proposed that weighmasters be assigned to other jobs besides fire patrolling to provide a flexible labor force.

Comparison of present and proposed labor utilization

Estimated labor for fire patrolling in the hog and sheep division is about 3 percent less than used in 1955. The present and proposed labor for each day of the week is shown in table 58.

TABLE 58.—*Fire patrolling in the hog and sheep division: Comparison of present and proposed labor utilization, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	114	208	−94	82.5
Tuesday	68	208	−140	205.9
Wednesday	104	208	−104	100.0
Thursday	239	208	+31	13.0
Friday	104	208	−104	100.0
Saturday	328	.....	+328	100.0
Sunday	114	.....	+114	100.0
Total	1,071	1,040	+31	2.9

Vaccinating and Spraying Hogs and Dipping Sheep

Present facilities

The facilities used for vaccinating and spraying hogs are an open pen area and a spray tunnel. The facilities used for dipping sheep consist of a holding pen, a dipping vat, and a drain pen.

Vaccinating, spraying, and dipping workload

There is no established workload for vaccinating and spraying hogs and dipping sheep. The service is provided as required by State laws and as requested by owners. The jobs are performed irregularly.

Operations and labor utilization

Hogs are usually vaccinated before being sprayed. They are driven to the vaccinating area and vaccinated; a veterinarian takes their temperature, and they are then driven into the spray tunnel. They are sprayed with a disinfectant solution for 3 minutes, and then driven to the outbound pens in the yards. Usually one worker assists in vaccinating hogs. He also sprays them.

Sheep are driven to the dipping area, dipped in the vat for 1 minute, and allowed to stand in the drain pen until most of the solution has drained from the wool (fig. 35). They are then driven to the outbound pens. An average of 7 workers is required to dip sheep—3 to drive them into the vat, and 4 to dip them and drive them out of the vat (fig. 36).

Workers for these jobs are assembled from other crews in the yards. In 1955, 645 man-hours were used in vaccinating and spraying hogs and dipping sheep. The labor used varied widely by day of week.

BN-6109

Figure 35.—Driving sheep into the dipping vat.

Proposed facilities

No new facilities are proposed.

Proposed operations and labor utilization

The vaccinating and spraying of hogs and dipping of sheep would be conducted in the usual manner. The estimated labor for the jobs is the same as that used in 1955—645 man-hours. Labor for this operation is provided for in the work schedule for the cleaning crew.

Comparison of present and proposed labor utilization

The labor used for vaccinating and spraying hogs and dipping sheep in 1955 was 645 man-hours. The same labor is proposed with improved facilities and operations (table 59).

TABLE 59.—*Spraying and vaccinating hogs and dipping sheep: Comparison of present and proposed labor utilization, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	130	130	0	0
Tuesday	134	134	0	0
Wednesday	186	186	0	0
Thursday	104	104	0	0
Friday	91	91	0	0
Saturday	0	0	0	0
Sunday	0	0	0	0
Total	645	645	0	0

BN-6110

Figure 36.—Dipping sheep.

Cleaning the Division

Present facilities

All the facilities in the hog and sheep division are involved in cleaning. The area includes pens and alleys on two levels, scale platforms and houses, and truck and rail dock offices. Equipment used for cleaning in the cattle division is also available to the hog and sheep division.

Cleaning workload

There is no established workload for cleaning.

Operations and labor utilization

Cleaning in the hog and sheep division is also referred to as regular and irregular cleaning. Regular cleaning, which is done by the same crew described under regular cleaning in the cattle division, consists of general cleaning and cleaning pens and alleys. It is performed in the same manner as in the cattle division. In 1955, 589 man-hours were used for general cleaning.

Cleaning sheep pens generally involves shoveling manure and debris from floors of pens and alleys onto dump carts, hauling it to the manure dump, and dumping it. Cleaning hog pens and alleys consists primarily of scraping and washing the floors, loading manure and

debris from the floors onto dump carts, hauling it to the manure dump, and dumping it. Dump carts and a tractor are the major equipment used in cleaning hog and sheep pens. Sometimes the loader is used in cleaning sheep pens. Crews for cleaning pens and alleys vary in size.

In 1955, 1,478 man-hours of regular cleaning labor were used in cleaning pens and alleys. A total of 2,067 man-hours of regular cleaning labor was used in the hog and sheep division. The amount of regular cleaning labor used in the hog and sheep division varied widely by days of the week.

For irregular cleaning in pens and alleys, workers are assigned from other jobs in the yard to complete their 8-hour work day, or 40-hour week. In 1955, 20,602 man-hours of irregular cleaning labor were used in the hog and sheep division. Observations of cleaning in the hog and sheep division indicate that efficiency is seriously hampered by constant shifting of workers into and out of the cleaning crew. Apparently, workers are shifted to the cleaning crew to finish a work day or work week, regardless of whether they are needed.

Summary of labor utilization for cleaning

A total of 22,669 man-hours was used for cleaning in the hog and sheep division in 1955. Regular cleaning labor amounted to 2,067 man-hours or about 9 percent of the total. Irregular cleaning labor amounted to 20,602 man-hours or about 91 percent of the total.

The amount of regular and irregular labor used for cleaning varies widely by day of the week. About 17 percent of the total labor is used on Monday, 15 percent on Tuesday, 21 percent on Wednesday, 22 percent on Thursday, and 25 percent on Friday.

Proposed facilities

The proposed facilities involved in cleaning would be all the facilities suggested for the hog and sheep division.

Proposed operations and labor utilization

As in the cattle division, research is needed on the cleaning operation to determine the kind of equipment, work methods, and sizes of crews needed to perform the operations more efficiently.

It is proposed that all cleaning in the hog and sheep division be done by workers assigned to the cleaning crew to complete their 8-hour day. A work schedule for workers cleaning in the hog and sheep division, shown in table 80, provides a total of 19,240 man-hours annually. However, it is estimated that 645 man-hours of this labor would be used for spraying hogs and dipping sheep. Thus, the estimated labor for cleaning is 18,595 man-hours annually.

During delays in other yard operations, day or night, workers should be organized to perform light cleaning jobs. No estimates are made of the number of man-hours this procedure would make available for cleaning in the hog and sheep division.

Summary of proposed utilization of labor for cleaning

A total of 18,595 man-hours annually, by workers assigned to the cleaning crew to complete their 8-hour day, is proposed for cleaning in the hog and sheep division. The labor proposed daily varies widely. Of the total, 13.3 percent is proposed for Monday, 15.5 percent for Tuesday, 22.0 percent for Wednesday, 22.5 percent for Thursday, and 26.7 percent for Friday.

Comparison of present and proposed labor utilization

The estimated labor for cleaning the hog and sheep division with proposed facilities and operations is about 18 percent less than in 1955. The present and proposed daily labor for cleaning is shown in table 60. The proposed labor for cleaning is less for each day of the week than that used in 1955.

TABLE 60.—*Cleaning the hog and sheep division: Comparison of present and proposed labor utilization, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	3,791	2,471	1,320	34.8
Tuesday	3,389	2,887	502	14.8
Wednesday	4,807	4,083	724	15.1
Thursday	4,884	4,187	697	14.3
Friday	5,798	4,967	831	14.3
Total	22,669	18,595	4,074	18.0

Feeding

Feeding hogs and sheep is discussed under yard service operations. To determine the total labor used for operating the hog and sheep division, it is estimated that 20 percent of the total labor for feeding livestock is for feeding hogs and sheep.

Comparison of present and proposed labor utilization

Estimated labor for feeding hogs and sheep with proposed facilities and operations is 6,648 man-hours. This is about 36 percent less than the 10,351 man-hours used in 1955. A comparison of the present and proposed daily labor is shown in table 61.

TABLE 61.—*Feeding hogs and sheep: Comparison of present and proposed labor utilization, by day of the week* [1]

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	1,756	1,075	681	38.8
Tuesday	1,609	1,075	534	33.2
Wednesday	1,720	900	820	47.7
Thursday	1,422	900	522	36.7
Friday	1,130	724	406	35.9
Saturday	1,087	724	363	33.4
Sunday	1,627	1,250	377	23.2
Total	10,351	6,648	3,703	35.8

[1] Based on the estimate that 20 percent of the total labor used for feeding livestock is used in feeding hogs and sheep.

Maintenance Services

Maintenance services in the stockyards are discussed under yard services. To determine the total labor used for operating the hog and sheep division, it is estimated that 20 percent of the total labor used for maintenance services would be used in the hog and sheep division.

Comparison of present and proposed labor utilization

The estimated labor for maintenance services in the hog and sheep division with improved facilities is 2,773 man-hours less than in 1955, almost a 34-percent reduction. A comparison of present and proposed daily labor for maintenance services in the hog and sheep division is shown in table 62.

TABLE 62.—*Maintenance services in the hog and sheep division: Comparison of present and proposed labor utilization, by day of the week* [1]

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	1,542	998	544	35.3
Tuesday	1,513	1,082	431	28.5
Wednesday	1,682	1,082	600	35.7
Thursday	1,699	1,082	617	36.3
Friday	1,666	1,082	584	35.1
Saturday	80	83	−3	3.8
Total	8,182	5,409	2,773	33.9

[1] Based on the estimate that 20 percent of the total labor used for maintenance services would be used in the hog and sheep division.

Watchman Services

Watchman services for the stockyards are discussed under yard services. To determine the total labor used for operating the hog and sheep division, it is estimated that 20 percent of the total labor for watchman services is used in this division.

Comparison of present and proposed labor utilization

The estimated labor for watchman services in the hog and sheep division with proposed facilities and operations is about 42 percent less than in 1955. A comparison of the present and proposed daily labor is shown in table 63.

TABLE 63.—*Watchman service for the hog and sheep division: Comparison of present and proposed labor utilization, by day of the week* [1]

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	1,076	572	504	46.8
Tuesday	1,134	572	562	49.6
Wednesday	1,076	458	618	57.4
Thursday	848	458	390	46.0
Friday	848	458	390	46.0
Saturday	536	572	−36	6.7
Sunday	772	572	200	25.9
Total	6,290	3,662	2,628	41.8

[1] Based on the estimate that 20 percent of the total labor used for watchmen services would be used in the hog and sheep division.

Proposed Labor Pool

A proposed labor pool for the yard is discussed under yard services. It is estimated that 20 percent of the unassigned labor in the labor pool would be used in the hog and sheep division.

This labor would be used on days of peak volume and on unexpected jobs for which no labor is provided. The unassigned labor in the labor pool, by day of week, is shown in table 64.

TABLE 64.—*Labor pool for the hog and sheep division: Estimated labor utilization, by day of the week* [1]

Day	Labor	
	Man-hours	*Percent*
Monday	590	24.1
Tuesday	498	20.3
Wednesday	396	16.2
Thursday	246	10.1
Friday	339	13.8
Saturday	106	4.3
Sunday	273	11.2
Total	2,448	100.0

[1] Based on the estimate that 20 percent of the unassigned labor in the labor pool would be used in the hog and sheep division.

Other Facilities Proposed

In addition to the facilities already discussed for the hog and sheep division, additional facilities that are needed for the most efficient handling of these animals include redesigned holding pens and a communications system.

Holding pens

A total of 655 holding pens with 262,658 square feet are proposed for hogs and sheep. This number is 16 percent more than the 565 pens with 269,603 square feet used in 1955. The pen space is 3 percent less, because proposed pens are smaller than those used in 1955. Estimated capacity of the proposed pens is 45,000 hogs and sheep; in 1955, capacity was 42,100. The increased capacity is obtained by changing the sizes of pens to conform to the sizes of consignments, giving better utilization of pen space. Of the total number of holding pens proposed for the division, 231 are suggested for hogs and 424 for sheep.

HOG HOLDING PENS.—The proposed 231 hog pens contain 92,260 square feet, compared with 213 pens and 90,695 square feet used for hogs in 1955. The estimated capacity of the 231 proposed pens is 15,300 hogs, compared with 14,400 hogs in 1955.

Out of the total number of hog pens proposed, 107 pens with 17,669 square feet are sales pens and 124 pens with 74,597 square feet are packer pens. No dealer or utility pens are proposed for hogs. The number of sales pens is 8 percent greater, but the pen space is 16 percent less, than hog sales pens used in 1955. The estimated capacity of the proposed sales pens at 6 square feet per hog is 2,900 hogs, compared to 2,800 in 1955.

The proposed number of packer pens is 8 percent larger and the pen space is 7 percent more than in 1955. Estimated capacity of the proposed packer hog pens is 12,400 hogs, compared with 11,600 hogs in 1955.

SHEEP HOLDING PENS.—The 424 proposed sheep pens cover 170,398 square feet, compared with 352 pens and 178,908 square feet used in 1955 for holding sheep. The proposed pens are 27 percent greater in number, with 5 percent less space. Estimated capacity of the proposed pens is 29,700 sheep, compared with 27,700 in 1955.

Of the sheep holding pens proposed, 300 are sales pens (15 percent more than in 1955), 36 are dealer pens, and 88 are packer pens. The sales pens would contain 85,675 square feet—8 percent less than in 1955. Estimated capacity of the proposed sales pens is 14,300 sheep, compared with 13,000 in 1955.

The proposed 36 dealer pens would comprise 14,914 square feet; in 1955 there were 28 pens with 24,181 square feet. Estimated capacity of the proposed pens is 1,500 sheep, compared with 2,000 in 1955.

Eighty-eight packer sheep pens with 69,809 square feet of space are proposed, as compared with 59 pens with 57,901 square feet presently used for sheep. Estimated capacity of the proposed pens is 13,900 sheep, compared with 12,000 in 1955.

Summary of Present and Proposed Facilities and Labor Utilization

Present and proposed facilities

The kind and amount of facilities proposed for the hog and sheep division as compared with facilities used in 1955 are summarized in table 65. Major changes are suggested in facilities for receiving and loading out hogs and sheep by trucks, and in facilities for holding, weighing, and feeding. In addition, a communications system is proposed.

Although a change in the location of the truck docks for receiving and loading out hogs and sheep is suggested, the number of truck docks proposed is about the same as in 1955. No T-pens will be needed for sheep if sales pens are located nearer the truck docks.

A number of changes are suggested for hog and sheep holding pens. Most of the changes provide for more and smaller holding pens, for both hogs and sheep. The pen area is decreased, and the capacity of the pens increased. The capacity of the sales and packer hog pens is increased from 14,400 to 15,300 hogs. The capacity of the sales, dealer, and packer pens for sheep is increased from 27,700 to 29,700 sheep.

The proposed number of scale blocks is the same as in 1955, but purchaser pens connected with the scale blocks for weighing both hogs and sheep have been increased. Purchaser pens for hogs are increased from 13 to 18 and the pen area from 3,680 to 7,168 square feet. Purchaser pens for sheep are increased from 65 to 83 and the pen area from 45,410 to 54,334 square feet.

A corn elevator with an area of 1,200 square feet is suggested for the hog and sheep division, to allow corn to be received there. In 1955 corn was received in the cattle division and transferred to the hog and sheep division. It is proposed that the storing of hay in lofts be abolished.

Present and proposed utilization of labor

The total estimated labor required for performing the various operating cycles in the hog and sheep division with proposed facilities and operations is 82,808 man-hours, about 32 percent less than the 122,393 man-hours used in 1955. The total estimated benefits in the hog and sheep division would be 39,585 man-hours.

Present and proposed labor utilization by operations is shown in table 66. The estimated labor with proposed facilities and operations

TABLE 65.—*Hog and sheep division: Comparison of present and proposed facilities by type of facility*

Type of facility	Present facilities		Proposed facilities		Increase or decrease			
	Item	Area	Item	Area	Item		Area	
	Number	*Square feet*	*Number*	*Square feet*	*Number*	*Percent*	*Square feet*	*Percent*
Truck receiving:								
Hogs—docks and chute pens	10	5,130	10	5,780	.....	.....	+650	+12.7
Sheep—docks and chute pens	11	10,928	10	7,476	−1	−9.1	−3,452	−31.6
Sheep T-pens	32	5,092	.....	0	−32	−100.0	−5,092	−100.0
Holding pens:								
Hogs—sales pens	99	21,090	107	17,669	+8	+8.1	−3,421	−16.2
Hogs—packer pens	114	69,605	124	74,597	+10	+8.8	+4,998	+7.2
Subtotal	213	90,695	231	92,266	+18	+8.5	+1,571	+1.7
Sheep:								
Sales pens	261	93,046	300	85,675	+39	+14.9	−7,371	−7.9
Dealer pens	28	24,181	36	14,914	+8	+28.6	−9,267	−38.3
Packer pens	59	57,901	88	69,809	+29	+49.2	+11,908	+20.6
Utility pens	4	3,780	.....	.....	−4	−100.0	−3,780	−100.0
Subtotal	352	178,908	424	170,398	+72	+20.5	−8,510	−4.8
Total	565	269,603	655	262,664	+90	−15.9	−6,939	−2.6
Weighing:								
Hogs:								
Scale platforms and houses	2	.....	2	.....	.....	.....	.....	.....
Scale pockets	1	.....	1	.....	.....	.....	.....	.....
Purchaser pens	13	3,680	18	7,168	+5	+38.5	+3,488	+94.8
Sheep:								
Scale platforms and houses	3	.....	3	.....	.....	.....	.....	.....
Scale pockets	1	.....	1	.....	.....	.....	.....	.....
Purchaser pens	65	45,410	83	54,334	+18	+27.7	+8,924	+19.7
Rail receiving and shipping:								
Hogs—docks and chute pens	8	5,088	8	5,088	.....	.....	.....	.....
Sheep—docks and chute pens	16	10,800	15	10,160	−1	−6.3	−640	−5.9
Sheep—shipping pens	18	14,240	20	12,480	+2	+11.1	−1,760	−12.4
Truck shipping:								
Sheep docks and chute pens	.....	.....	2	1,920	+2	.....	+1,920	.....
Feeding:								
Buildings [1]	2	10,286	2	10,286	.....	.....	.....	.....
Corn elevator	.....	.....	1	1,200	1	.....	1,200	.....
Horse and mule barn	1	30,400	.....	.....	−1	−100.0	−30,400	−100.0
Communications system	1	.....	1	.....	.....	.....	.....	.....

[1] First floor space.

is less for all operating cycles except one—vaccinating and spraying hogs and dipping sheep. The proposed labor for this operating cycle is the same as in 1955.

The present and proposed utilization of labor for operating the hog and sheep division, by day of the week, is shown in table 67. A decrease in the amount of labor is incurred each day with improved facilities and operations, ranging from about 4 percent on Saturday to 38 percent on Thursday.

Yard Services

Feeding Livestock

Facilities, equipment, and labor are used interchangeably in feeding all types of livestock. This analysis of the operations includes both the cattle and the hog and sheep divisions.

Present facilities and equipment

Two brick buildings, each divided into three barns, are located on the east side, almost in the center of the cattle division, for storing feed and for making feed deliveries. The two buildings are separated by rail tracks. Each building has direct rail connections.

The building north of the tracks is about 46 feet wide and 265 feet long. It is used primarily for hay. It is constructed so that trucks cannot enter it, and feed must be loaded and unloaded through doors.

The building south of the tracks is 52 feet wide and 265 feet long. It includes an office, about 14 by 52 feet, which is used by clerks and supervisory personnel of the hay barn. Part of the building, about 48 feet long and 52 feet wide, is used for sacked feed and shelled corn. The remainder is used for storing hay.

TABLE 66.—*Hog and sheep division: Comparison of present and proposed utilization of labor by operations*

Operating cycle	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Receiving by truck	29,646	20,479	9,167	30.9
Receiving and shipping by rail	5,047	4,544	503	10.0
Weighing	26,057	12,516	13,541	52.0
Keying	8,254	4,576	3,678	44.6
Water patrolling	4,181	2,246	1,935	46.3
Fire patrolling	1,071	1,040	31	2.9
Cleaning	22,669	18,595	4,074	18.0
Vaccinating and spraying hogs and dipping sheep	645	645	0	0
Maintenance	8,182	5,409	2,773	33.9
Feeding	10,351	6,648	3,703	35.8
Watchmen services	6,290	3,662	2,628	41.8
Labor pool	0	2,448	−2,448	0
Total	122,393	82,808	39,585	32.3

TABLE 67.—*Hog and sheep division: Present and proposed utilization of labor for operations, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	24,297	15,460	8,837	36.4
Tuesday	22,100	15,423	6,677	30.2
Wednesday	23,805	15,156	8,649	36.3
Thursday	21,191	13,272	7,919	37.4
Friday	17,897	12,916	4,981	27.8
Saturday	5,174	4,964	210	4.1
Sunday	7,929	5,617	2,312	29.2
Total	122,393	82,808	39,585	32.3

Trucks can enter the building to load and unload hay. The barns have a storage capacity of about 35,000 bales of hay, and 3,100 100-pound sacks of feed.

Hart barn, a two-story structure located on the west side of North Main Street, is rented by the stockyards. A portion of the space in this building—first and second floors is used to store hay. It has storage capacity for about 15,000 bales. This building is improperly designed for unloading, storing, and loading hay efficiently.

Four barns are located in the hog and sheep division for storing feed. Two are actually the haylofts of the former horse and mule barn, and have a capacity of about 8,500 bales of hay. Storing hay in lofts means excessive handling.

One barn is a separate building about 36 feet wide and 135 feet long, with a storage capacity of about 4,000 bales of hay. The fourth barn, on the ground floor of the former horse and mule building, has a storage area about 30 by 190 feet, with a capacity of 12,500 bales. Trucks, tractors, and wagons can be driven into these latter two barns for loading and unloading.

Hay barns provide a total storage capacity for about 71,000 bales of hay. The barns are rarely filled to capacity, but about a 3-month supply of feed is maintained at all times.

Equipment used in feeding livestock includes a hay bailer, an auger-type conveyor, 2 endless-chain conveyors, 7 tractors, 9 wagons, and some hay hooks (fig. 37). The first three items are in the barn south of the rail tracks. The tractors and wagons are used for making feed deliveries; tractors are stored overnight in the stockyards barn, and wagons usually are left at the hay barn. In the cattle division, platforms for temporary storage are constructed across the corners of many pens (fig. 38).

Corn bins, with a holding capacity of about 25 bushels of shelled corn, are located throughout the hog division.

BN-6111

Figure 37.—Loading a wagon with feed at the hay barn.

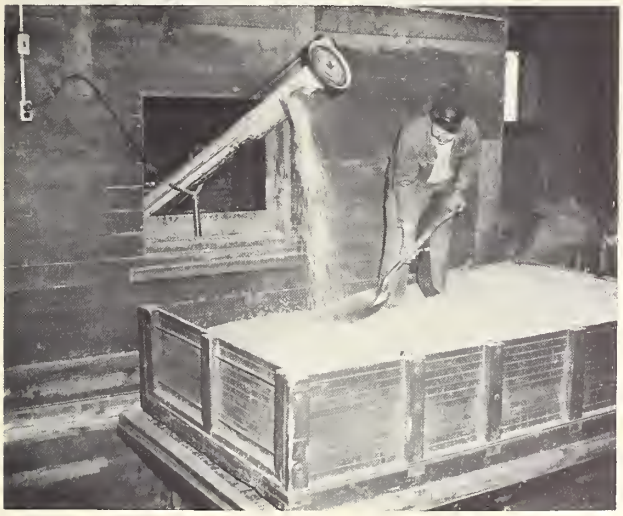
Feeding workload

Several functions are performed in the feeding of livestock. However, for this analysis, data are shown only for the primary workload—feed deliveries. A feed delivery includes taking an order slip for feed at the hay barn

BN-6112

Figure 38.—A worker racking hay in making feed deliveries.

office, driving the wagon to the barn, loading the wagon with feed, hauling the feed to the pens for which it was requested, unloading the feed, and returning to the hay barn office. Unloading the feed has various meanings. Feed delivered in the cattle division may be removed from the wagon and racked (placed on temporary storage facilities), or bales of hay and bags of feed may be removed from the wagons and opened and spread in feed mangers. Shelled corn is delivered to the hog division in wagons (fig. 39) and later stored in bins. Bales of hay delivered to the sheep division may just be unloaded in pens, or they may be opened and shaken.



BN-6113

Figure 39.—Filling the wagon with shelled corn for delivery to the hog section.

In 1955, 17,186 feed deliveries, with 297,741 units of feed, were made. A bale of hay, a 100-pound sack of feed, a bushel of oats, and 100 pounds of shelled corn each represent a unit.

Feed deliveries are made 24 hours a day, 7 days a week. In 1955, 63 percent or 10,829 of the feed deliveries were made on the first shift, 20 percent or 3,449 on the second shift, and 17 percent or 2,908 on the third shift. The average number of feed units per delivery on the first shift was 24.8; the second shift, 4.6; and the third shift, 3.2. Deliveries were heaviest on Sunday, Monday, and Tuesday, and lightest on Friday and Saturday. Deliveries were fairly light on Wednesday and Thursday (table 68).

In 1955, 78 percent or 8,463 of the feed deliveries were made in the cattle division, and 22 percent or 2,366 in the hog and sheep division. The average number of feed units per delivery was 30.8 in the hog and sheep division and 23.2 in the cattle division. Although a few deliveries were made to the hog and sheep division on the second shift, by far the major portion were made on the first shift. For this study all feed deliveries to the hog and sheep division are considered to have been made on the first shift.

Operations and labor utilization

The jobs performed in feeding livestock are clerking, unloading, transferring, baling hay, feeding hogs, and delivering feed. The work day for feeding livestock is divided into three shifts; the first shift is from 7 a. m. to 4 p. m., the second from 3 p. m. to 11 p. m., and the third from 11 p. m. to 7 a. m. Regular crews are established only for clerking, feeding hogs, and making feed deliveries. The other jobs are performed irregularly and usually by workers delivering feed. Feeding jobs are supervised by a foreman.

CLERKING.—Clerks take the orders for feed from commission firms, dealers, packers, or shippers, and prepare feed tickets and drive slips for the orders. The feed ticket includes the date; the name of the commission firm, dealer, packer, or shipper ordering the feed; the number of the pen to which the feed is to be delivered; and the quantity and type of feed. Drive slips show the pen numbers and the quantity and type of feed to be delivered to each pen, and may comprise one or more feed tickets. Clerks stamp the time on each drive slip just before handing it to a delivery worker. They also stamp the time on the delivery slip when the delivery worker returns it to them.

One worker does the clerking from 8:30 a. m. to 4:30 p. m., Monday through Friday. Another worker clerks from 7 a. m. to 8:30 a. m.,

TABLE 68.—*Feeding livestock: Feed deliveries and feed delivered, by shift and day of week*[1]

Day	7 a.m. to 4 p.m.		3 p.m. to 11 p.m.		11 p.m. to 7 a.m.		Total	
	Feed deliveries	Units of feed per delivery	Feed deliveries	Units of feed per delivery	Feed deliveries	Units of feed per delivery	Feed deliveries	Units of feed per delivery
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Monday	1,664	29.9	1,033	3.6	969	2.1	3,666	15.1
Tuesday	1,729	23.4	715	3.7	715	1.9	3,159	14.1
Wednesday	1,547	24.7	504	3.4	302	2.5	2,353	17.3
Thursday	1,365	19.1	390	11.9	195	6.4	1,950	16.4
Friday	1,027	21.1	132	6.9	219	7.6	1,378	18.2
Saturday	1,092	20.3	119	3.8	323	5.5	1,534	18.5
Sunday	2,405	27.5	556	3.0	185	2.6	3,146	21.7
Total	10,829	24.8	3,449	4.6	2,908	3.2	17,186	17.2

[1] A bale of hay, a 100-pound sack of feed, a bushel of oats, and 100 pounds of shelled corn each represent a unit.

or later on Monday, Tuesday, and Wednesday, and from 7 a. m. to 4 p. m. on Saturday. The foreman clerks on Sunday. All clerical work on the second and third shifts is performed by feed deliverymen.

The heavy workload during part of the first shift usually requires two workers. One worker takes feed orders, prepares feed tickets and feed slips, and dispatches delivery workers. The other prepares an audit of the previous day's business, showing weight and cost of feed delivered to each shipper. After the audit is completed, one worker is assigned to another job in the yards.

In 1955, 4,251 man-hours were used for clerking on the first shift, including 468 man-hours of the foreman's time for clerking on Sunday.

UNLOADING FEED.—Sometimes hay is unloaded not from tractor trailers into a barn, but directly onto feed wagons. This labor is included in the labor used for making deliveries. No observations were noted on feed being unloaded from rail cars or tractor trailers into barns. In 1955, only 1,722 man-hours were charged to unloading feed.

TRANSFERRING FEED.—Hay stored in the Hart barn is later moved to the cattle or the hog and sheep divisions and frequently restored in barns there. This is called transferring feed. In 1955, 1,342 man-hours were charged to transferring.

BALING HAY.—In 1955, 2,044 man-hours were charged to rebaling loose hay. At other markets where feeding operations were observed, loose hay is sold at reduced prices.

FEEDING HOGS is a specific job where only packer hogs are fed. A regular worker is assigned to the job Monday through Friday, from 7 a. m. to 3 p. m. On Saturday and Sunday a worker assigned to another crew feeds the hogs.

Feeding hogs involves unlocking corn bins, filling a peck bucket with corn, throwing the corn into the pens, and locking the corn bin (figs. 40 and 41). Packers provide instructions as to the hogs to be fed and the amount of feed. Rarely does the worker devote 8 hours to feeding packer hogs. Usually, when he completes the job, he is transferred to another job in the yards.

Observations were made of a worker feeding hogs for 3.5 hours. He spent about half of his time feeding hogs and maintaining rec-

BN-0114

Figure 40.—A worker taking corn from a corn bin in the hog section.

BN–6115

Figure 41.—A worker feeding corn to hogs.

ords. He was idle the other half, primarily because packers had not provided him with feeding instructions. In 1955, 1,980 man-hours were used for feeding hogs.

FEED DELIVERY.—Two workers with a tractor and wagon make feed deliveries on the first shift. The number of crews operating on the first shift varies from about 7 on Sunday to about 4 on Friday. One worker with a tractor and wagon makes the deliveries on the second and third shifts, but a second worker is frequently added.

The time required to make a feed delivery depends primarily on the services rendered after the load of feed is transported to the proper pens. Roughly, the time required to rack a unit of feed is about 0.3 minute; to spread a unit of feed, about 0.8 minute; and to shake a unit of feed, about 1.75 minutes. The total time required to rack a load of 30 bales of hay is 9 minutes; to spread it, about 24 minutes; and to shake it, about 52.5 minutes. The stockyard does not control the services rendered in making feed deliveries. An estimated 80 percent of the feed delivered is spread or shaken (fig. 42). Other factors which affect the time required to make a delivery are the distance traveled and the time required to load the wagon.

An analysis of the time of departure and time of return stamped on drive slips for individual deliveries indicates that the average time required to make a delivery on the first shift is 1 hour and 15 minutes. Roughly, about 14 percent of the time is devoted to loading the wagon, 39 percent to hauling, and 47 percent to unloading. The labor required per delivery, based on the average time is 2.5 man-hours. An average of 2.8 man-hours was used by the stockyards for making a delivery. The 0.3 man-hour difference between labor required and labor used per delivery indicates that the size of the crew delivering feed may be too large. In 1955, 30,466 man-hours were used for making feed deliveries on the first shift.

The labor used per delivery is 2.8 man-hours on the first shift, 1.7 man-hours on the second shift, and 2.4 man-hours on the third shift. However, the average number of units of feed per delivery is 24.9 on the first shift, 4.6 on the second, and 3.2 on the third. The labor per unit of feed on the second and third shifts is almost six times as great as on the first shift. Feed deliveries are made on the second and third shifts primarily for the convenience of market customers; deliveries are small and the workload is often so light that it fails to keep the worker busy. In 1955, 5,060 man-hours were used making deliveries on the second shift and 4,891 man-hours on the third shift.

The total labor used for making feed deliveries in 1955 amounted to 40,417 man-hours.

Summary of present labor utilization

The total labor used for feeding livestock in 1955 was 51,756 man-hours—about 3 man-hours for each delivery made. Feed delivery accounted for about 78 percent of the total labor used; clerking labor accounted for 9 percent; unloading, 3 percent; transferring feed, 2 percent; baling hay, 4 percent; and feeding hogs, 4 percent.

About 81 percent of the total labor used for

BN–6116

Figure 42.—A worker spreading hay in a manger in making feed deliveries.

feeding livestock was used on the first shift. The only labor used on the second and third shifts is for feed delivery, and it is relatively light.

The labor used for feeding livestock varies by day of the week. Some 15 to 17 percent of the weekly labor is used daily on Sunday, Monday, Tuesday, and Wednesday; 13 percent is used on Thursday, 11 percent on Friday, and 10 percent on Saturday.

Proposed facilities

The use of Hart barn for storing hay should be discontinued. Hart barn is not on the property of the Fort Worth Stockyards and hay stored in it must be moved to the yards across the heavy traffic on North Main Street. The hay barn north of the tracks in the cattle division should also be abandoned for storing feed.

Two new buildings are suggested for storing hay. These buildings would be pole-type structures with roofs and would be located in the northeast corner of the market, in an area now occupied by rail dock chute pens and shipping pens. One building would be 60 by 120 feet, and the other 60 by 140 feet. The floors would be concrete, raised about 1 foot. The buildings would be 20 feet high. They would have a storage capacity of about 35,000 bales of hay stacked 9 high, or 50,000 bales stacked 12 high. These structures would permit hay to be palletized if desirable.

The building in the cattle division south of the rail tracks would be used for practically the same purposes as in 1955.

The two barns in the lofts of the former horse and mule barns should be abandoned as hay barns, since they require excessive labor in storing hay. The other two barns, in which hay can be unloaded and loaded efficiently, provide a storage capacity for about 16,500 bales. These structures permit hay to be palletized. This should be an adequate amount of barn space for the hog and sheep division. Excess hay could be stored in the two new structures suggested in the cattle division. If bales were stacked 12 high in the new structure suggested, the total capacity for all barns proposed for storing hay would be about 79,000 bales—or approximately 8,000 more than the capacity available in 1955.

A grain bin 24 by 40 feet is suggested at the southeast corner of the hog and sheep division in an area now occupied by a rail dock chute pen. This structure would provide storage space for about 100,000 pounds of corn and 600 bags of sacked feed, as well as working space for employees. The location of this structure would eliminate the necessity of transferring grain from the hay barn in the cattle division to the corn bins in the hog and sheep division. Furthermore, since corn could be fed directly from the proposed structures, the bins would not be needed.

Proposed operations and labor utilization

CLERKING.—The job of auditing the previous day's feed business should be removed from the duties of the feed clerk and assigned to clerks in the general office, who could presumably absorb the job in addition to their regular duties. This should permit one worker to perform all the clerical work in connection with the feeding of livestock.

A work schedule for a clerk performing the clerical duties in feeding livestock is shown in table 80. It provides for 8 hours daily, 7 days each week. The annual man-hours provided by the schedule is 2,912.

UNLOADING FEED.—The new buildings suggested for storing feed should permit a higher degree of efficiency in the unloading and storing of feed than present buildings. However, no unloading operations were observed and it is assumed that the same labor used in 1955 for unloading—1,722 man-hours—would be used with the improved facilities. Labor for unloading would be obtained from workers assigned to feed deliveries.

TRANSFERRING FEED.—The abandonment of Hart barn for storing feed should eliminate the labor used for transferring feed. In 1955 the labor for this job amounted to 1,342 man-hours.

BALING HAY.—No studies were made of the rebaling operation or the quantities of loose hay rebaled. It is questionable whether loose hay can be profitably rebaled. The stockyards management should review this operation thoroughly. It might be more economical for loose hay to be sold at reduced prices. Eliminating the hay baling should reduce feeding labor by 2,044 man-hours, the amount used in 1955.

FEEDING HOGS.—Feeding of hogs should be assigned to workers making feed deliveries. The corn bin proposed for storing corn in the hog and sheep division would permit deliverymen to fill their wagons at the bin, drive down alleys, and feed corn to hogs in pens directly from the wagons. These workers also would make other feed deliveries simultaneously. The estimated labor required to perform the job by the proposed method would be only 990 man-hours—half as much as in 1955.

FEED DELIVERIES.—The same methods used in 1955 to make feed deliveries on the first shift should be continued, but the improved and reorganized facilities should reduce the workload and the average time required for making deliveries.

Construction of a corn bin in the hog and sheep division, so that corn received on the market may be unloaded there instead of at the barn in the cattle division, should reduce the number of deliveries by 395 annually, based on the 1955 volume. Total deliveries made on

the first shift would be reduced from 10,829 to 10,434. The reorganized sales pens would provide a compact area for commission firms, with shorter drives required to make a delivery.

With improved facilities, it is estimated that the average time required per delivery is 1 hour. Labor requirements per delivery, with two-man work crews, would be 2 man-hours.

The stockyards should develop an agreement with commission firms so that workers on the second and third shifts would feed only from the racks. This would remove the need for a wagon and tractor, and should prevent placing more than one worker on either the second or third shift at any time.

Based on the improved facilities proposed herein and a reduced workload on the first shift, an assumed work schedule for workers making feed deliveries is shown in table 80. The schedule provides for 6 crews on the first shift on Sunday, 5 on Monday and Tuesday, 4 on Wednesday and Thursday, and 3 on Friday and Saturday. Total labor for the first shift provided annually by this work schedule is 24,960 man-hours; but only 21,791 man-hours would be used for making feed deliveries. An estimated 2,712 of these man-hours would be used for unloading feed and feeding hogs. Also, an estimated 457 man-hours would be used for receiving and shipping cattle by rail. Labor provided for making feed deliveries is roughly 2 man-hours per delivery.

The work schedule proposes one worker for the second shift and one for the third, each day; the labor provided is 5,824 man-hours annually. The suggested hours for these two workers are from 4 p. m. to 12 midnight, and from 12 midnight to 8 a. m. If the worker on duty between 12 midnight and 8 a. m. started feeding hogs at about 7 a. m., he might have the job completed by 8 a. m.

A total of 27,615 man-hours is provided by the work schedule for making feed deliveries.

Summary of proposed labor utilization

The estimated labor for feeding livestock with proposed facilities and operations is 33,239 man-hours. Of the total labor, 83 percent would be used for feed delivery, 9 percent for clerking, 5 percent for unloading, and 3 percent for feeding hogs. No labor is estimated for baling hay because loose hay may be sold without rebaling. The facilities proposed should make it unnecessary to transfer feed.

The estimated labor varies by day of the week; 16 percent of the total weekly labor would be used on Monday, 16 percent on Tuesday, 14 percent on Wednesday, 14 percent on Thursday, 11 percent on Friday, 11 percent on Saturday, and 18 percent on Sunday.

Comparison of present and proposed utilization of labor

The total estimated labor for feeding livestock with improved facilities and operations is about 36 percent less than used in 1955. Labor per delivery with improved facilities and operations is 2 man-hours, compared with 3 man-hours in 1955.

A comparison of present and proposed utilization of labor by jobs and work shifts is shown in table 69. Clerking should be reduced by 1,339 man-hours annually by transferring the audit of the previous day's feed business to the general offices. The labor used for baling hay—2,044 man-hours in 1955—should be eliminated by selling loose hay at reduced prices. Improved and rearranged facilities should eliminate the 1,342 man-hours used for transferring feed in 1955, and should reduce the labor used for feeding hogs by 990 man-hours and feed deliveries by 12,802 man-hours.

The labor used for feeding livestock with present facilities and operations as compared with the estimated labor with proposed facilities and operations is shown in table 70. The amount of labor proposed each day of the week is less than that used in 1955.

TABLE 69.—*Feeding livestock: Comparison of present and proposed utilization of labor, by jobs and shifts*

Job	7 a.m. to 4 p.m.	3 p.m. to 11 p.m.	11 p.m. to 7 a.m.	Total
	Man-hours	*Man-hours*	*Man-hours*	*Man-hours*
Present facilities and operations:				
Clerking.....	4,251	0	0	4,251
Unloading...	1,722	0	0	1,722
Transferring.	1,342	0	0	1,342
Baling hay ..	2,044	0	0	2,044
Feeding hogs	1,980	0	0	1,980
Feed delivery	30,466	5,060	4,891	40,417
Total.....	41,805	5,060	4,891	51,756
Proposed facilities and operations:				
Clerking.....	2,912	0	0	2,912
Unloading...	1,722	0	0	1,722
Transferring.	0	0	0	0
Baling hay ..	0	0	0	0
Feeding hogs	990	0	0	990
Feed delivery	21,791	[1] 2,912	[2] 2,912	27,615
Total.....	27,415	2,912	2,912	33,239
Benefits with proposed facilities and operations:				
Clerking.....	1,339	0	0	1,339
Unloading...	0	0	0	0
Transferring.	1,342	0	0	1,342
Baling hay ..	2,044	0	0	2,044
Feeding hogs	990	0	0	990
Feed delivery	8,675	2,148	1,979	12,802
Total.....	14,390	2,148	1,979	18,517

[1] The shift for feed delivery is from 4 p. m. to 12 midnight.
[2] The shift for feed delivery is from 12 midnight to 8 a. m.

Maintenance Services

Maintenance services are provided in both divisions of the yards. Most workers performing maintenance services work in both divisions; therefore, maintenance services are discussed for the stockyards as a whole.

Present facilities

Four buildings and an open storage area are used in connection with maintenance supplies and services. The stockyards barn, located in the cattle division, is used to store cleaning and feeding equipment and to provide space for a garage. Three buildings and an open storage area are located out of the yards proper across North Main Street. One building is used as a carpenter's shop, and as headquarters for maintenance workers. Another building is used as a blacksmith shop and the other is used as an electrical shop. The area adjacent to these three buildings is used for storing supplies.

TABLE 70.—*Feeding livestock: Comparison of present and proposed labor utilization*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	8,781	5,342	3,439	39.2
Tuesday	8,044	5,342	2,702	33.6
Wednesday	8,602	4,511	4,091	47.6
Thursday	7,108	4,511	2,597	36.5
Friday	5,652	3,679	1,973	34.9
Saturday	5,433	3,679	1,754	32.3
Sunday	8,136	6,175	1,961	24.1
Total	51,756	33,239	18,517	35.8

Maintenance workload

No definitely established maintenance workload has been determined. Management provides the kind and amount of maintenance services which it believes is necessary to keep the facilities and equipment in proper operating condition.

Operations and labor utilization

Maintenance services at the stockyards are provided by an electrician, a plumber and helper, a blacksmith, a mechanic, and a maintenance crew (usually carpenters).

These workers normally work 8 hours, from 7:30 a. m. to 4 p. m. with a half-hour for lunch, Monday through Friday. When the volume of livestock at the market is heavy, maintenance workers occasionally are shifted to other jobs for short periods. The plumber or his helper is on duty each day except Sunday; one works Monday through Friday, and the other Tuesday through Saturday.

Headquarters for the maintenance crew is the carpentry shop. After reporting to the shop for duty, the workers go to the part of the yard where they are working for the day. Just before noon, they return to the carpentry shop for lunch. After lunch they go back to work, and back to the shop just before the end of the day. It is estimated that maintenance workers average 1 hour of their 8-hour work day going to and from headquarters. A more central headquarters should reduce the time required for these trips.

No analysis was made of the maintenance jobs performed. In 1955, the total labor used for maintenance services was 40,911 man-hours. The maintenance crew accounted for about 73 percent of the total labor; the plumber and helper, 11 percent; the electrician, 6 percent; the mechanic, 7 percent; and the blacksmith, 3 percent. The labor used is fairly constant, Monday through Friday. Minimum labor is used on Saturday.

Proposed facilities

The building north of the rail tracks, used in 1955 to store hay, should be used as maintenance headquarters. The 3 buildings across North Main Street and the company barn could be abandoned. These buildings and Hart Barn —which should also be abandoned—are on property leased by the Fort Worth Stockyards. The area now occupied by the company barn could be used for pen space for cattle in the improved market.

The building proposed as maintenance headquarters is centrally located. Considerable saving in time spent going between various jobs and headquarters should result.

It is proposed that an open area about 20 fet wide and 310 feet long, parallel to the building proposed for centralizing all maintenance services, be used for storing supplies.

Proposed operations and labor utilization

A proposed work schedule for maintenance service workers is shown in table 80. It provides for 13 workers, the estimated number needed to keep the new facilities in good repair. The schedule provides for 1 plumber and helper, 1 electrician, 1 mechanic, and a maintenance crew of 9 workers. The blacksmith job, which was only a part-time job, is eliminated. Blacksmith work can probably be contracted more cheaply than the stockyards could provide a worker to do the job. The total labor provided annually for maintenance services is 27,040 man-hours. The maintenance crew accounts for about 69 percent of the labor, the plumber and helper 15 percent, and the electrician and mechanic 8 percent each. The labor proposed is fairly constant for each day of the week except Monday and Saturday. The plumber would work Monday and his helper Saturday.

Comparison of present and proposed labor utilization

Total estimated labor for maintenance services with improved facilities is about 34 percent less than in 1955. Estimated savings are 13,871 man-hours annually.

Labor utilization for maintenance with present and proposed facilities, by type of job, is shown in table 71. A saving in labor is expected in each type of job with improved facilities, with the largest saving in the maintenance crew.

Labor for maintenance services with present and proposed facilities and operations, by day of the week, is shown in table 72.

TABLE 71.—*Maintenance services: Present and proposed labor utilization, by type of job*

Type of job	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations
	Man-hours	*Man-hours*	*Man-hours*
Plumber	4,359	4,160	199
Electrician	2,453	2,080	373
Blacksmith	1,352	0	1,352
Mechanic	2,737	2,080	657
Maintenance crew	30,010	18,720	11,290
Total	40,911	27,040	13,871

TABLE 72.—*Maintenance services: Present and proposed labor utilization, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	7,712	4,992	2,720	35.3
Tuesday	7,566	4,408	2,158	28.5
Wednesday	8,410	5,408	3,002	35.7
Thursday	8,495	5,408	3,087	36.3
Friday	8,328	5,408	2,920	35.1
Saturday	400	416	−16	4.0
Total	40,911	27,040	13,871	33.9

Watchman Services

Present services and labor utilization

Watchman service is provided in both livestock divisions. Workers sometimes perform this service in both division, or perform service that is charged to both divisions. Service is discussed for the stockyards as a whole, rather than by divisions.

Watchman service workload

No specific workload for watchman service is established. Management provides the kind and amount of watchman service that it believes will afford the maximum protection to property, and will prevent losses from fire and theft. Watchmen observe local fire and safety ordinances.

Watchman service and labor utilization

Watchmen are provided for the Exchange Building and its gate, the front gate, drive-in gate, back gate, ADT (American District Telegraph), and fire patrolling.

EXCHANGE BUILDING.—Watchman service for the Exchange Building varies by days of the week. Monday through Friday, the service is provided from 8:30 p. m. to 8 a. m.; on Saturday from 7:30 p. m. to 7 a. m.; and on Sunday from 6:30 p. m. to 6 a. m. The workers on these shifts work 11 hours a day, excluding a half-hour for lunch. The man on duty in the Exchange Building during the night hours is an ADT watchman.

Partial or complete watchman service also is provided in the Exchange Building from 4:30 p. m. to 7:30 or 8:30 p. m. every day. The watchman on duty during these hours is not an ADT watchman. Between about 8 a. m. and 4:30 p. m. the building is without a regular watchman, but watchmen performing other jobs frequently go through the building during these hours.

In 1955, 5,434 man-hours were used for watchman service at the Exchange Building.

EXCHANGE BUILDING GATE.—Watchman service is provided at the Exchange Building gate from 6 a. m. to 2 p. m., or 8 hours daily, Monday through Friday. This watchman maintains orderly parking and issues permits to customers. Observations indicated that the workload of this job was fairly light.

In 1955, 2,080 man-hours were used for watchman service at the Exchange Building gate.

FRONT GATE.—Watchmen at the front gate (gate off Exchange Avenue to the cattle yards) work from 7 a. m. to 4 p. m., Monday through Friday. One worker works from 7 a. m. to 3 p. m., and another reports for duty at 3 p. m. and works until 4 p. m. The primary duties are to unlock, open, close, and lock the gate so that authorized vehicles may enter and leave the cattle yards. The workload here is fairly light.

In 1955, 2,340 man-hours were used for watchman services at the front gate.

DRIVE-IN GATE.—Watchmen at the drive-in gate (actually cattle truck docks) work from 7 p. m. to 6:30 a. m., or 11 hours daily 4 days a week, Sunday through Wednesday. The primary duties are to direct and maintain orderly parking of trucks at the cattle truck docks. On only a few days during the year is business so large that orderly parking of trucks becomes a major problem.

In 1955, 2,288 man-hours were used for watchman service at the drive-in gate.

BACK GATE.—Services are provided at the back gate, off 28th Street, from 7 a. m. to 3:30 p. m., 5 days a week, Monday through Friday. The primary duties are to unlock, open, close, and lock the gate so that authorized vehicles may enter and leave the cattle yards. Since manure trucks leave the yards and reenter through this gate, the workload is heavy.

In 1955, 2,184 man-hours were used for watchman service at the back gate.

ADT.—Two watchmen patrol the entire yards from 6 p. m. to 5:30 a. m. every night. They patrol established routes and punch time clocks at 14 stations located at regular intervals throughout the yards. Each worker tours the yards six times during each shift. The time required to make a tour of the yards is 1.5 hours. These watchmen maintain a watch over the yards for fire, trespassing, and thefts.

In 1955, 8,008 man-hours were used for ADT watchman service patrolling both the cattle and the hog and sheep divisions.

FIRE PATROL.—Regular fire patrolling hours vary by day of week. Most of the fire patrolling is confined to the cattle division. Regular fire patrolling is ordinarily performed from 7 a. m. to 6:30 p. m., Sunday through Friday, and from 8 a. m. to 4:30 p. m. on Saturday. Regular fire patrolling may be performed part of the time between 6 p. m. and 5:30 a. m., overlapping the ADT services.

In 1955, 9,110 man-hours were used for fire patrolling.

Summary of present labor utilization

In 1955, the total labor used for watchman service was 31,444 man-hours. Of this labor, 17 percent was used at the Exchange Building, 7 percent at the Exchange Building gate, 8 percent at the front gate, 7 percent at the drive-in gate, 7 percent at the back gate, 25 percent for ADT services, and 29 percent for fire patrolling.

More labor is used for watchman service on Monday, Tuesday, and Wednesday than on other days. As a rule, more people are in the yards on these days. Saturday, the day when activity on the yards is at the lowest point, the least labor is used.

Proposed watchman services and labor utilization

FRONT GATE AND BACK GATE.—With proposed facilities and operations the truck docks for receiving would be located at the north end of the cattle division and the truck docks for loading out at the south end. Workers in the receiving and loading-out crews would be able to see persons entering the yard by the front gate and by the back gate. The gates could be opened and closed during the day by the people entering the yards and it is suggested that watchman service at these two gates be eliminated, decreasing the annual labor used for watchman services by 4,524 man-hours.

EXCHANGE BUILDING GATE.—The parking area proposed near the Exchange building should provide ample parking space for market patrons. It is therefore suggested that watchman service at the Exchange Building gate be eliminated. This would reduce the annual labor by 2,080 man-hours.

DRIVE-IN GATE.—Improved facilities provide for a truck dock approach almost twice the size of the one used in 1955 for receiving cattle by truck, and the problem of orderly parking for trucks should be alleviated. Therefore, it is proposed that watchman service at the drive-in gate be discontinued, reducing the total annual labor by 2,288 man-hours.

EXCAHNGE BUILDING, ADT, AND FIRE PATROL.—Watchman services for the Exchange Building, ADT, and fire patrol are discussed as a unit, because it is proposed that workers be used interchangeably between these three different services. All watchman services should be coordinated to provide maximum protection against fire and theft. The amount of services naturally would have to conform to local fire ordinances and insurance requirements. A proposed schedule for the Exchange Building, ADT, and fire patrolling is shown in table 80. It proposes 1 worker for the Exchange Building from 7:30 p. m. to 7 a. m., 7 days each week, with a total of 77 man-hours weekly or 4,004 man-hours annually. No watchman services are suggested for the Exchange Building during the day, but fire patrolling workers can inspect the building at intervals during the day, when they are patrolling the yards.

The proposed work schedule provides for the same number of workers for ADT services as in 1955. The workers also would work the same hours. These services consume 8,008 man-hours annually.

The schedule proposes two workers for fire patrolling. Hours for 1 worker would be from 6:30 a. m. to 6 p. m., Monday, Tuesday, Saturday, and Sunday. Fire patrolling on Wednesday, Thursday, and Friday during these hours would be performed by weighmasters and other workers.

Another worker would fire patrol each night from 6 p. m. to 5:30 a. m. Thus, the yards would be patrolled every hour of the day except from 5:30 a. m. to 6:30 a. m. The schedule provides for 6,292 man-hours annually for fire patrolling.

Summary of proposed utilization of labor

The estimated labor for watchman services with improved facilities and operations is 18,304 man-hours annually. Of the estimated labor, 22 percent is for watchmen at the Ex-

change Building, 44 percent for ADT watchmen, and 34 percent for fire patrol watchmen. Improved facilities provide for more parking, and should permit the abolishment of watchman services for the Exchange Building gate, front gate, drive-in gate, and back gate.

The same amount of labor is proposed for watchman service each day except Wednesday, Thursday, and Friday. On these three days additional labor for watchman service could be provided by weighmasters and other workers assigned temporarily to fire patrolling.

Comparison of present and proposed labor utilization

Total estimated labor for watchman service with improved facilities and operation is about 42 percent less than was used in 1955. The comparison of present and proposed utilization of labor by type of service is shown in table 73.

TABLE 73.—*Watchman service: Comparison of present and proposed utilization of labor, by type of service*

Type of service	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations
	Man-hours	*Man-hours*	*Man-hours*
Exchange Building	5,434	4,004	1,430
Exchange Building gate	2,080	0	2,080
Front gate	2,340	0	2,340
Drive-in gate	2,288	0	2,288
Back gate	2,184	0	2,184
ADT serviccs	8,008	8,008	0
Fire patrol	9,110	6,292	2,818
Total	31,444	18,304	13,140

The labor for watchman service with improved facilities and operations would be less for each day of the week except Saturday than that used in 1955. The total labor proposed for Saturday is 182 man-hours greater. The greatest reduction in labor would come during the first part of the week, as shown in table 74.

TABLE 74.—*Watchman service: Comparison of present and proposed utilization of labor, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	5,382	2,860	2,522	46.9
Tuesday	5,668	2,860	2,808	49.5
Wednesday	5,382	2,288	3,094	57.5
Thursday	4,238	2,288	1,950	46.0
Friday	4,238	2,288	1,950	46.0
Saturday	2,678	2,860	−182	6.8
Sunday	3,858	2,860	998	25.9
Total	31,444	18,304	13,140	41.8

Proposed Central Labor Pool

A central labor pool is suggested to provide a high degree of efficiency when the volume of business is at peak levels, and to assist in performing many sporadic jobs for which regularly scheduled labor is not warranted. For example, when the extra scale block in the cattle division is needed, labor for the scale block would be obtained from the labor pool. The same situation would exist for the scale block in the hog and sheep division. Labor from the pool would be used for any job in the yards as the occasion demanded. Pool labor would also be used to fill in for regular workers on vacation or workers who are off because of illness.

The proposed labor pool would have 10 workers. A work schedule for the labor pool, by day of the week and by work shift, is shown in table 80. On the first shift 7 workers or 56 man-hours are suggested for Monday and Tuesday, 6 workers or 48 man-hours on Wednesday, 4 workers or 32 man-hours on Thursday and Friday, and 1 worker or 8 man-hours on Saturday and Sunday, for a total of 240 man-hours weekly or 12,480 man-hours annually.

On the second shift, 2 workers or 16 man-hours are suggested for every day except Sunday, with 3 workers or 24 man-hours suggested for that day. These workers would assist with rail receiving and shipping, weighing directs, and any other operations that need labor for short periods. Total pool labor on the second shift would be 120 man-hours weekly, or 6,240 man-hours annually.

One worker, or 8 man-hours, is suggested for the third shift for every day except Saturday. This worker would assist in practically the same jobs that would be performed by workers in the labor pool on the second shift, and total labor on this shift wuld be 48 man-hours weekly, or 2,496 annually.

Total labor provided by the proposed central labor pool is 408 man-hours weekly, or 21,216 man-hours annually. The size of the pool is an estimate based on observations of the overall operations of the market. The labor pool would be centrally located in the yards. Workers would be assigned to jobs only when they are needed and only for the time they are needed. At other times they would be idle. The pool supervisor could determine by the amount of idle time of the workers the proper size for the labor pool. This method is reported satisfactory with some firms.

Although 21,216 man-hours of labor are pro-

vided annually in the proposed labor pool, 8,975 man-hours are assigned to sporadic jobs. The total amount of unassigned labor in the pool is 12,241 man-hours. The unassigned labor, by days of the week, is shown in table 75.

TABLE 75.—*Proposed central labor pool: Unassigned labor, by day of week*

Day	Labor	
	Man-hours	*Percent*
Monday	2,948	24.1
Tuesday	2,492	20.4
Wednesday	1,980	16.2
Thursday	1,228	10.0
Friday	1,695	13.8
Saturday	533	4.3
Sunday	1,365	11.2
Total	12,241	100.0

Summary of Present and Proposed Labor Utilization

The estimated labor for performing the various yard services (feeding, maintenance, and watchman services) with proposed facilities and operations is 78,583 man-hours, about 36 percent less than the 124,111 man-hours used in 1955. The estimated benefits to the stockyards should amount to 45,528 man-hours annually.

A comparison of present and proposed utilization of labor by operating cycles is shown in table 76. The labor with proposed facilities is less for each operating cycle. Decreases in the estimated labor range from 34 percent for maintenance to 42 percent for watchman services.

A comparison of present and proposed utilization of labor for yard services, by day of week, is shown in table 77. The estimated labor with proposed facilities and methods is less for each day of the week. The decreases range from about 18.3 percent on Saturday to 45.5 percent on Wednesday.

TABLE 76.—*Yard services: Present and proposed utilization of labor by operating cycle*[1]

Operating cycle	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Feeding livestock	51,756	33,239	18,517	35.8
Maintenance	40,911	27,040	13,871	33.9
Watchman service	31,444	18,304	13,140	41.8
Total	124.111	78,583	45,528	36.7

[1] Does not include labor for the proposed labor pool.

TABLE 77.—*Yard services: Comparison of present and proposed utilization of labor, by day of the week* [1]

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday	21,875	13,194	8,681	39.7
Tuesday	21,278	13,610	7,668	36.0
Wednesday	22,394	12,207	10,187	45.5
Thursday	19,841	12,207	7,634	38.5
Friday	18,218	11,375	6,843	37.6
Saturday	8,511	6,955	1,556	18.3
Sunday	11,994	9,035	2,059	24.7
Total	124,111	78,583	45,528	36.7

[1] Does not include labor of proposed labor pool.

Comparison of Present and Proposed Labor Utilization in the Fort Worth Stockyards

The labor used by the stockyards in 1955 for operating the cattle and the hog and sheep divisions and yard services was about 459,000 man-hours. Commission firms used about 29,000 man-hours for driving cattle to their sales pens on the first shift. The total labor used by the stockyards and commission firms in 1955 was 488,000 man-hours.

The estimated labor for operating the cattle and the hog and sheep divisions and yard services, including the driving job with proposed facilities and operations is about 282,000 man-hours, or 38 percent less than the total labor used in 1955. Estimated benefits to the stockyards are 176,000 man-hours. Total benefits are estimated at 206,000 man-hours.

A comparison of present and proposed utilization of labor in the stockyards, by divisions, is shown in table 78. In 1955, the stockyards used about 336,000 man-hours operating the cattle division. With proposed facilities and operations the estimated labor required for operating the cattle division is about 200,000 man-hours, and this labor includes driving cattle on the first shift. The estimated annual benefits to the stockyards for operating the

cattle division with improved facilities and operation is 137,000 man-hours.

TABLE 78.—*Comparison of present and proposed utilization of labor in the Fort Worth Stockyards, by divisions*

Division	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Cattle division...	336,403	199,656	136,747	40.6
Hog and sheep division.....	122,393	82,808	39,585	32.3
Total.....	458,796	282,464	176,332	38.4

The stockyards used about 122,000 man-hours operating the hog and sheep division in 1955. With proposed facilities and operations, the estimated labor required for operating the division is about 83,000 man-hours. The estimated annual benefits to the stockyards for operating the hog and sheep division with improved facilities and operations are about 39,000 man-hours.

A comparison of present and proposed utilization of labor in the Stockyards, by day of the week, is shown in table 79. Less labor is used each day in operating the stockyards with proposed facilities and operations. The reductions range from 22 percent on Saturday to 45 percent on Thursday.

TABLE 79.—*Comparison of present and proposed utilization of labor in the Fort Worth Stockyards, by day of the week*

Day	Present facilities and operations	Proposed facilities and operations	Benefits with proposed facilities and operations	
	Man-hours	*Man-hours*	*Man-hours*	*Percent*
Monday.....	90,132	53,927	36,205	40.2
Tuesday.....	87,045	55,254	31,791	36.5
Wednesday..	85,759	51,333	34,426	40.1
Thursday....	78,555	43,444	35,111	44.7
Friday.....	59,777	38,768	21,009	35.1
Saturday....	21,332	16,587	4,745	22.2
Sunday.....	36,196	23,151	13,045	36.0
Total..	458,796	282,464	176,332	38.4

Proposed Arrangement of Facilities at the Fort Worth Stockyards

The arrangement of the facilities proposed for the Fort Worth Stockyards is shown in figure 43. All the facilities proposed would be located on the main market area between North Main Street and the Fort Worth Belt Railway. Therefore, the tract of land west of North Main Street, now leased by the stockyards, would no longer be needed for conducting market operations.

Only one change, a larger parking area, is suggested in connection with the area surrounding the office facilities. The area proposed is located to the rear and side of the Exchange Building, directly behind the garages; it is centrally located for patrons visiting all segments of the market, and would provide parking for about 139 vehicles. The proposed parking area, plus the present parking area, would provide space for about 286 vehicles, thereby relieving the parking problem around the Exchange Building.

Arrangement of Facilities in the Cattle Division

The truck dock approach, truck docks, trailer alleys, and T-pens for receiving cattle are grouped near the center of the north end of the cattle division. The trailer alleys are arranged so that one or both may be used for receiving cattle arriving by pickups and trailers. The arrangement of the trailer alleys would permit trailers and pickups to unload and move quickly out of the alley. T-pens are arranged in rows directly behind the docks and trailer alley. Each row of pens has an ingress and egress alley. Simultaneous receiving and driving can be carried on without interference.

The proposed sales pens are grouped behind the T-pens, allowing commission firms to operate in a compact area, rather than in separate sections of the yards. The pens are located near the truck dock and trailer alley. As the average distance of the sales pens to the points of unloading is only about 600 feet, drives of cattle from the truck docks and trailer alley to the sales pens would be fairly short. The sales pens are designed in blocks 48 feet deep and 132 feet wide. Each block is surrounded by a 12-foot alley giving all pens an in and out alley. Thus, cattle can be driven simultaneously from the truck docks to the pens and from the pens to the scale blocks.

Scale blocks for weighing market and dealer cattle are located in a row just behind the sales pens. The arrangement of the scale blocks provides commission firms ready access with short drives to all scales. This permits scale blocks to be closed as the weighing workload declines during the week, with adequate

weighing services still provided for all commission firms.

Six rows of purchaser pens are located below the scale blocks. This permits short drives from catch pens. The location of the purchaser pens in relation to the truck, rail, and packer pens results in short drives in moving cattle out of or to any part of the yards.

Dealer pens are in a compact area just below the purchaser pens. The arrangement provides a convenient location for dealers receiving cattle purchased from commission firms and weighed at the scale blocks.

Packer pens are divided into two groups, each of which would be used by packers located nearest it. One group is in the southeast corner of the cattle division. The other is in the east central part of the division. The arrangement and location of the two groups provides for a free flow of cattle to the packer pens from the truck dock, purchaser pens, or dealer pens.

Utility pens are located in small groups throughout the yards in order that all groups operating on the market may have ready access to the pens. The arrangement of the utility pens also would permit different groups to expand their areas without disrupting the lines of flow provided by the arrangement of present facilities.

Facilities for loading out cattle by truck are located in the center and at the south end of the yards, to permit short drives for cattle.

The rail docks would remain on the eastern side of the market, but the shipping pens are grouped adjacent to the rail docks in the southeast section, near the purchaser and dealer pens from which cattle are usually driven in loading out by rail.

The two new buildings proposed for storing hay are located at the northeast corner of the yards—away from the pens—to minimize the possibility of losses to the yards from fires. The location of the two buildings provides for short hauls in delivering hay to commission firms. One of the centrally located feed barns would be retained.

The proposed maintenance building is almost in the center of the cattle division, providing the shortest walking distance to and from jobs in the yards. The adjacent storage area provides a central location for storing, feeding, and cleaning equipment.

Special facilities, such as the branding and vaccinating chutes, would remain in their present location.

Flow of Cattle Through the Proposed Facilities

Cattle received by trucks, trailers, and pickups would be unloaded at the truck docks and trailer alleys. From the truck docks the cattle would be driven either to the T-pens, where they would be held temporarily before being driven to sales and packer pens, or directly from the truck docks and trailer alleys to sales and packer pens. Ample drive alleys provide for a free and direct flow of cattle from the truck docks and trailer alleys at all times without interference with other market operations.

Cattle sold by commission firms could be driven to any scale block for weighing without back drives or crossflows, with short drives.

A direct flow is also provided for cattle driven from the catch pens to purchaser pens and from the purchaser pens to dealer pens, packer pens, shipping pens, and the rail and truckloading docks.

The truckloading docks at the south end of the cattle division permit a direct flow of livestock from the docks for receiving cattle through the various operations, and out of the market. Many different groups of cattle could move simultaneously through the market in an orderly, unhampered manner.

Arrangement of Proposed Facilities in the Hog and Sheep Division

Figure 43 shows the arrangement of proposed facilities in the hog and sheep division. The arrangement of the facilities provides a separate section for each species.

Arrangement of Proposed Hog Facilities

The truck approach for both hogs and sheep is located at the northeast corner of the hog and sheep division. The truck docks for receiving hogs and sheep are arranged in a row running north and south. Docks for receiving hogs occupy the north half of the dock, and docks for receiving sheep occupy the south half.

Hog sales pens are grouped in a compact area behind the truck docks for receiving hogs, providing short drives in yarding hogs in these pens. Behind the sales pens is the scale block for weighing market hogs, and behind the scale blocks is a group of hog purchaser pens. The arrangement of the hog sales pens in relation to the scale block and purchaser pens makes short drives possible for commission firms in bringing up hogs for weighing and for the stockyard workers yarding hogs in purchaser pens.

The packer pens for hogs are adjacent to the sales pens and extend to the chute pens at the rail docks. The packer pens behind the truck docks would be used for holding hogs temporarily before weighing them. The scale block for weighing direct hogs is behind these pens. The arrangement of the packer hog pens provides short drives when packer hogs are received into the market. The rail docks for

receiving and shipping hogs and sheep are along the east side of the hog and sheep division. The rail docks for hogs occupy the north part of the dock adjacent to the hog and packer pens. The special facility for immunizing hogs would remain at the southern end of the rail dock.

The corn elevator would be adjacent to the immunization area, allowing corn to be received in the hog and sheep area.

Flow of Hogs Through the Proposed Facilities

Hogs received by truck would be unloaded at the truck docks. Market hogs would be driven directly to the sales pens. The flow would be direct and the drive short. Packer hogs would be driven either to packer holding pens located at the rear of the truck dock and, subsequently, to the scale block, or directly to the scale block for weighing. In the first case, the packer pens at the rear of the truck dock would serve as T-pens. The flow of packer hogs from the truck docks to packer pens or to the scale block is direct and the drive is short.

Market hogs would be driven from the sales pens to the scale block where they are weighed, and from the scale block to purchaser pens. Hogs purchased by packers would be driven directly from the scale blocks to packer pens. The flow of hogs from the sales pen to the scale blocks and then to purchaser and packer pens is direct, and drives are short.

Packer hogs received by rail would be driven from the rail dock to the scale block for weighing direct hogs, and from the scale block to packer pens. Although the flow in receiving packer hogs into the market would be circuitous, the number of alleys would permit drives to be made without interference from other operations or crossflows.

Few hogs are loaded out of the market either by truck or rail, but they would be loaded out at the same docks used for receiving hogs.

Arrangement of Proposed Sheep Facilities

Truck docks for receiving sheep would occupy the south half of the dock described for receiving hogs and sheep. As the sheep sales pens are grouped to the rear and side of the truck docks for receiving sheep, the flow from truck docks to sales pens would be direct and short.

The three scale blocks proposed for weighing are arranged in a row behind the sales pens. Adjacent to and behind the scale blocks, purchaser pens are arranged in a group. Purchaser pens also occupy the second floor of the hog and sheep division. Dealer pens are grouped on the south side of the purchaser pens. Packer pens are grouped in the southeast corner of the hog and sheep division.

Shipping pens are grouped beside the purchaser pens and adjacent to the rail dock. The truck docks for loading out sheep are located at the south side of the dealer pens. The rail docks for receiving and shipping sheep occupy the south part of the rail dock.

Flow of Sheep Through the Proposed Facilities

Sheep received by trucks would be unloaded at the truck docks. Market sheep would be driven directly from the truck docks to the sales pens. Direct sheep would be driven directly from the truck docks, weighed, and yarded in packer pens. The arrangement of the facilities for receiving market or direct sheep provides for a direct flow with comparatively short drives.

Market sheep would be driven from the sales pens to the scale blocks where they are weighed, and from the scale block to purchaser pens. The arrangement of the sales pens, scale blocks, and purchaser pens on the first floor provides for a direct flow of sheep through the weighing and yarding operations. The arrangement of purchaser pens on the second floor necessitates a circuitous flow in yarding sheep after weighing, but there would be no interference from other operations.

The flow of sheep from purchaser pens on the first floor to dealer, packer, and shipping pens is direct and the drives are short. The flow of sheep from purchaser pens on the second floor to these pens would be circuitous, but again without interference from other operations.

Packer sheep received by rail would be driven from the rail dock to the scale block for weighing, and from the scale block to packer pens. The flow of packer sheep received by rail would not be direct, but it would be without interference from other operations.

Sheep would be loaded out of the market at the same rail docks used for receiving sheep. The flow of sheep from shipping pens to rail dock is short, and the drives would be short.

Few sheep are loaded out of the market by trucks. The flow of sheep from purchaser pens to loading out docks would not be direct, but the number of necessary drives would be small. The flow of sheep from dealer pens to the loading-out dock would be direct and the drives would be short.

Cost of Constructing Proposed Facilities

Cost estimates for the suggested facilities are based on average construction costs prevailing at terminal stockyards in 1956. Some of the estimates are for new construction. Oth-

ers allow for the use of part of the existing facilities. These estimates are presented only as a guide for the stockyards in determining whether the investment in proposed facilities would be worthwhile. They are not intended to replace the estimates of local contractors or of the engineering staff at the stockyards. Construction costs for specific items vary in different localities, and estimates of local contractors or the stockyards engineering staff might be considerably different. The facilities proposed do not give full consideration to the layout of the underground water and sewage system; it may be necessary to vary the sizes of the facilities to avoid disruption of the system. Variations in the sizes of the facilities proposed could cause variations in the costs.

The present underground water and sewage system has been in use for many years. It is suggested that the system be inspected for adequacy, and altered if necessary, before the proposed facilities are constructed. No cost estimates are provided herein for any changes which might be necessary in connection with the underground water and sewage system.

All facilities proposed would be constructed in accordance with the designs contained in USDA Agricultural Handbook No. 36, "Suggestions for Improving Services and Facilities at Public Terminal Stockyards." The total estimated cost for the facilities proposed for the stockyards is about three quarters of a million dollars. The amount of construction needed and the estimated cost for specific facilities by divisions are summarized in detail at the end of this section.

Exchange Building Parking Area

Approximately 5,460 square yards of blacktop paving is proposed for the Exchange Building parking area. The total cost of applying blacktop paving to the brick surface of the area would approximate $8,681.

Cattle Division

Total estimated cost of the facilities proposed for the cattle division is $630,907.

Truck Receiving Facilities

Estimated cost of constructing the proposed facilities for receiving cattle by large and small trucks is $33,210. The present truck approach area, about 7,500 square yards, has a gravel surface. A blacktop paving would be applied to the area.

The 47 T-pens proposed for receiving cattle by large trucks would be obtained by renovating the present T-pens. Only about 1,500 feet of fencing would be required

New fences are suggested for the trailer alley. The proposed T-pens for receiving cattle by pick-up and trailer would be obtained by renovating the present T-pens. Some 1,800 feet of fencing and 179 gates would be required. In addition, the alleys would be paved and the paving in the area of construction would be reshaped.

Holding Pens

Total estimated cost for holding pens is $251,778, but the amount of construction needed and the subsequent cost vary by type of holding pens.

Sales pens

The 816 proposed sales pens would all be new. The area would have to be razed of its present pens, water troughs, and mangers. An estimated 32,070 feet of fencing, 12,000 feet of mangers, 4,800 feet of water troughs, and 1,152 gates would be needed. In addition, paving of alleys and reshaping of paving in the area of construction would be necessary. Additional water and sewers would also be needed. Total estimated cost is $207,654.

Dealer pens

Most of the 219 pens proposed for dealers would be obtained by relocating dealers in a section of the market where the pens are smaller, but new dealer pens would be constructed over the area occupied by rail tracks, for which 3,000 cubic yards of fill is required.

Additional dealer pens would be obtained by renovating the area of one of the present scale blocks. Some 2,190 feet of fence, 2,000 feet of mangers, 800 feet of water troughs, and 59 gates would be required. The reshaping of paving in areas of construction and additional water and sewers would be needed. The total estimated cost is $20,108.

Packer pens

The 173 proposed packer pens would be obtained by relocating packers. No construction costs are involved.

Utility pens

Some of the 387 utility pens would be obtained by constructing new pens, some by renovating, and some by using existing pens. It is estimated that 4,530 feet of fence and 172 gates would be needed. Total estimated cost of utility pens is $24,016.

Weighing Facilities

The total estimated cost of the 6 scale blocks and 144 purchaser pens suggested is $192,700.

Scale blocks

Eight of the present scale blocks would be razed and 6 new ones constructed. Furthermore, pens in the area proposed for the scale blocks would have to be razed. The weighing mechanisms of the old scales would be used in

the new scale blocks. It is estimated that 6 scale platforms, racks, houses, and pits, 20,030 feet of fencing, and 714 gates would be needed to provide the 6 proposed scale blocks. Reshaping of paving in the area of construction and the paving of alleys would be necessary. Additional water and sewer facilities also would be needed. The estimated total cost is $158,638.

Purchaser pens

The present pens in the area proposed for purchaser pens would have to be razed and 144 new pens constructed. It is estimated that 8,510 feet of fence and 144 gates would be needed. Paving in areas of construction would have to be reshaped, and the alleys paved. Additional water and sewers would be needed. The estimated cost is $34,062.

Rail Receiving and Shipping Facilities

Most of the 86 proposed shipping pens would be obtained by relocating the shipping area, but some of the pens would be obtained by renovating one of the present scale areas. Some 480 feet of fence and 20 gates would be needed, at a cost of $2,256.

Truck Shipping Facilities

Pens in the area proposed for the truck shipping facilities would be razed. The area proposed for the truck approach is of brick surface and only blacktopping of 2,800 square yards would be necessary. In addition, 7 dock and chute pens, 760 feet of fence, and 23 gates would be needed. Reshaping of paving in the area of construction and additional water and sewers would be necessary. The total estimated cost is $12,901.

Feeding Facilities

Two new pole-type hay barns for storing feed, comprising about 15,600 square feet, would cost about $23,400.

Miscellaneous Facilities and Items

A catwalk 2,600 feet long and 4 feet wide is proposed for the cattle division, at a cost of $31,200. A scale tower 15 feet square and 15 feet higher than the catwalk is proposed at a cost of $2,000. A communications system which would permit two-way contact between the scale tower, Exchange Building, and all major work stations would cost about $10,000, and the estimated cost for additional lighting for the yards is $5,000.

An estimated cost for renovating an office in the hay barn for the centralized clerking system is $750.

A cost of $30,000 is estimated for razing present facilities in areas where new construction is proposed. Income from the sale of salvage materials might reduce this cost, but salvage materials at stockyards have a low value. Also, the use of salvage material in the construction of stockyard facilities is usually unsatisfactory.

Hog and Sheep Division

The total estimated cost of the proposed facilities for the hog and sheep division is $129,487.

Truck Receiving Facilities

The estimated cost for constructing the proposed facilities for receiving hogs and sheep by trucks is $27,899, for new construction. Paving of the truck dock approach includes 4,370 square yards, and would require grading and a gravel base over which blacktop paving would be applied. A truck dock, 20 chutes, and a chute house also would be constructed.

Holding Pens

Total estimated cost for the proposed holding pens is $26,020.

Sales pens

Most of the 107 hog pens would be obtained by constructing new pens. About 1,718 feet of fence, 100 gates, and 14 water troughs would be required. In addition, reshaping of concrete paving would be necessary (1,100 square yards at $2 per square yard).

About one-half of the 300 proposed sheep sales pens would be obtained by using the present pens, and half would be obtained by dividing present pens and constructing new pens. About 2,682 feet of fence, 111 gates, and 10 water troughs would be required. In addition, 900 square yards of concrete paving would be necessary.

Dealer pens

Practically all of the 36 proposed dealer pens would be new. Some 400 feet of fence, 35 gates, and 11 water troughs would be required.

Packer pens

Most of the 124 packer hog pens would be obtained by using present pens in the yards, but a few pens would be new. It is estimated that 260 feet of fence and 10 gates would be required. No reshaping of paving would be necessary.

Practically all of the 88 packer pens for sheep would be obtained by using present pens or dividing some of the present pens. Some 260 feet of fence and 7 gates would be required. No reshaping of paving would be necessary.

Weighing Facilities

The total estimated cost for the proposed 4 scale blocks and 101 purchaser pens is $43,239.

Scale blocks

Four of the present scale blocks would be razed and 4 new ones constructed. The weighing mechanisms of the old scale blocks would be retained. Four scale platforms, racks, houses, and pits, and 888 linear feet of fence would be needed.

Purchaser pens

Practically all of the 101 proposed purchaser pens would be obtained by using the present pens in the yards. It is estimated that only 980 linear feet of fence and 26 gates would be needed to provide the full number of pens proposed.

Miscellaneous Facilities and Items

A corn elevator, with approximately 1,200 square feet, is proposed at an estimated cost of $5,000. A communications system, which would permit two-way contact between the scale tower, Exchange Building, and major work stations in the hog and sheep division, would cost about $5,000. A cost of $15,000 is estimated for razing present facilities where new construction is proposed.

Estimated Cost of Construction

Facility and Item	*Dollars*	
Exchange Building:		
Parking area paving 5,460 sq. yd. @ $1.50 per sq. yd.	8,190	
Engineering fee, 6 percent	491	
Total Exchange Building		8,681
Cattle Division:		
Truck receiving facilities:		
Truck and trailer approach paving 7,500 sq. yds. @ $1.50 per sq. yd.	11,250	
Large trucks:		
Fence—1,500 linear ft. @ $2.20 per linear ft.	3,300	
Gates—68 @ $60 each	4,080	
Reshaping paving	670	
Subtotal	8,050	
Trailer alley:		
Fence—1,800 linear ft. @ $2.20 per linear ft.	3,960	
Gates—179 @ $50 each	8,950	
Reshaping paving and paving alleys	1,000	
Subtotal	13,910	
Total truck receiving facilities	33,210	
Holding pen facilities:		
Sales pens:		
Fence—32,070 linear ft. @ $2.20 per linear ft.	70,554	
Mangers—12,000 linear ft. @ $1.50 per linear ft.	18,000	
Water troughs—4,800 linear ft. @ $4.00 per linear ft.	19,200	
Gates—1,152 @ $60 each	69,120	
Reshaping paving and paving alleys	18,630	
Additional water and sewer	12,150	
Subtotal	207,654	
Dealer pens:		
Fence—2,190 linear ft. @ $2.20 per linear ft.	4,818	
Mangers—2,000 linear ft. @ $1.50 per linear ft.	3,000	
Water troughs—800 linear ft. @ $4.00 per linear ft.	3,200	
Gates—59 @ $60 each	3,540	
Fill—3,000 cu. yd. @ $1.00 per cu. yd.	3,000	
Reshaping paving	1,350	
Additional water and sewer	1,200	
Subtotal	20,108	
Utility pens:		
Fence—5,080 linear ft. @ $2.20 per linear ft.	11,176	
Mangers—280 linear ft. @ $1.50 per linear ft.	420	
Water troughs—140 linear ft. @ $4.00 per linear ft.	560	
Gates—186 @ $60 each	11,160	
Reshaping paving	400	
Additional water and sewer	300	
Subtotal	24,016	
Total holding pen facilities	251,778	
Weighing facilities:		
Scale blocks:		
6 scale platforms and racks	9,000	
6 scale houses and pits	49,000	
Fence—20,030 linear ft. @ $2.20	44,066	
Gates—714 @ $60 each	42,840	
Reshaping paving and paving alleys	10,000	
Additional water and sewer	3,732	
Subtotal	158,638	
Purchaser pens:		
Fence—8,510 linear ft. @ $2.20 per linear ft.	18,722	
Gates—144 @ $60 each	8,640	
Reshaping paving	4,000	
Additional water and sewer	2,700	
Subtotal	34,062	
Total weighing facilities	192,700	
Rail receiving and shipping facilities:		
Shipping pens:		
Fence—480 linear ft. @ $2.20 per linear ft.	1,056	
Gates—20 @ $60 each	1,200	
Total rail receiving and shipping facilities	2,256	
Truck shipping facilities:		
Truck approach paving 2,800 sq. yd. @ $1.50 per sq. yd.	4,200	
7 docks and chute pens	4,895	
Fence—760 linear ft. @ $2.20 per linear ft.	1,672	
Gates 23 @ $60 each	1,380	
Reshaping paving	454	
Additional water and sewer	300	
Total truck shipping facilities	12,901	
Feeding facilities:		
2 barns 15,600 sq. ft. @ $1.50 per sq. ft.	23,400	
Miscellaneous facilities and items:		
Catwalk—2,600 linear ft. @ $12.00 per linear ft.	31,200	
Scale tower	2,000	
Communication system	10,000	

Facility and Item	*Dollars*	
Miscellaneous facilities and items—Continued.		
Electric lighting	5,000	
Renovating office in hay barn	750	
Demolition of areas for new construction	30,000	
Total miscellaneous facilities and items	78,950	
Total cattle division	595,195	
Engineering fee, 6 percent	35,712	
Grand total cattle division		630,907
Hog and sheep division:		
Truck receiving facilities:		
Truck approach paving 4,370 sq. yds. @ $2.70 per sq. yd	11,799	
20 truck docks	14,400	
1 chute house 18 by 20 feet	1,700	
Total truck receiving facilities	27,899	
Holding pen facilities:		
Sales pens:		
Fence—4,400 linear ft. @ $1.75 per linear ft	7,700	
Gates—211 @ $45 each	9,495	
Water troughs—24 @ $25 each	600	
Reshaping paving	4,000	
Subtotal	21,795	
Dealer pens:		
Fence—400 linear ft. @ $1.75 per linear ft	700	
Gates—35 @ $45 each	1,575	
Water troughs—11 @ $25 each	275	
Subtotal	2,550	
Packer pens:		
Fence—520 linear ft. @ $1.75 per ft.	910	
Gates—17 @ $45 each	765	
Subtotal	1,675	
Total holding pen facilities	26,020	
Weighing facilities:		
Scale blocks:		
4 scale platforms and racks	6,000	
4 scale houses and pits	32,800	
Fence—888 linear ft. @ $1.75 per linear ft	1,554	
Subtotal	40,354	
Purchaser pens:		
Fence—980 linear ft. @ $1.75 per linear ft	1,715	
Gates—26 @ $45 each	1,170	
Subtotal	2,885	
Total weighing facilities	43,239	
Miscellaneous facilities and items:		
Corn elevator	5,000	
Communication system	5,000	
Demolition of areas for new construction	15,000	
Total miscellaneous facilities and items	25,000	
Total hog and sheep division	122,158	
Engineering fee, 6 percent	7,329	
Grand total hog and sheep division		129,487
Total all divisions	725,543	
Engineering fee, 6 percent	43,532	
Grand total all divisions		769,075

Comparison of Estimated Construction Costs and Benefits

The estimated total cost of the facilities proposed for the Stockyards is $770,000. Estimated benefits to the stockyards from increased efficiency in operating the market with the improved facilities and operations are about 176,000 man-hours annually. Estimated total benefits are 206,000 man-hours. Benefits from savings in labor to the stockyards should pay for the cost of the improved facilities in a reasonable period of time.

Exchange Building

Providing additional parking area around the Exchange Building would cost an estimated $8,681. No tangible benefits are estimated for this expenditure; however, it should provide more and better service to market patrons and could result in more business for the stockyards.

Cattle Division

Estimated cost of proposed facilities for the cattle division is $630,907. The estimated annual saving in labor to the stockyards is 136,747 man-hours.

Some of the costs for facilities proposed in the cattle division may produce no tangible benefits. The proposed paving of the truck approach is such an item. This approach has been used for years without blacktop paving—although farmers and truckers have complained about the rough surface. The cost of paving the approach is estimated at $11,250.

It is impractical to relate specific items of suggested expenditures to proposed benefits because the improvement of one feature of the market alone would not necessarily result in any benefits. For illustration, improving the facilities for receiving cattle by trucks, without improving the sales pens, would result in little saving. Reorganizing the cattle sales pens without relocating scale blocks would accomplish very little. The estimated tangible benefits from improved facilities outlined in this report depend upon a complete and general reorganization of the facilities in the cattle division.

Still other benefits from improved facilities in the cattle division in addition to those proposed can be pointed out. For illustration, a saving should result from the stockyards relinquishing its lease on the area across North Main Street. Furthermore, benefits should ac-

crue to all groups operating in the division. The compact areas suggested for commission firms, dealers, and packers which would result in shorter distances between work stations, should reduce their labor requirements considerably. In addition, producers should benefit by spending less time in unloading livestock at the market. Losses from shrinkage and injuries should be minimized. Furthermore, a saving should result to purchasers in assembling and driving livestock through the market to docks for loading out.

Hog and Sheep Division

The estimated cost for facilities proposed in the hog and sheep division is $129,487, compared with estimated annual savings in labor of 39,585 man-hours. The component parts of the hog and sheep division have the same relation to one another as the facilities in the cattle division. Consequently, the benefits would depend upon a general improvement of facilities. In addition, benefits similar to those described for the cattle division should accrue to all groups using the market.

APPENDIX

TABLE 80.—*Assumed schedule for workers by divisions, operating cycles, jobs, work shifts, and day of week*

Item	Worker number	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	Weekly total	Yearly total
		Man-hours	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*
Cattle Division:										
Receiving cattle by truck:										
Clerking: [1]										
7 a. m. to 3 p. m. . .	52	8	8	8	8	.....	.....	8		
	53	.....	.....	.....	.....	.....	8	.....		
	2	.....	.....	.....	.....	8	.....	.....		
Subtotal.....	.....	8	8	8	8	8	8	8	56	2,912
3 p. m. to 11 p. m. .	53	8	8	8	.....	.....	.....	8		
	54	.....	.....	.....	8	8	8	.....		
Subtotal.....	.....	8	8	8	8	8	8	8	56	2,912
11 p. m. to 7 a. m. .	54	8	.....	.....	.....	.....	.....	8		
	55	.....	8	8	8	8	8	.....		
Subtotal.....	.....	8	8	8	8	8	8	8	56	2,912
Total.....	.....	24	24	24	24	24	24	24	168	8,736
Checking: [2]										
7 a. m. to 3 p. m. . .	56	8	8	8	.....	.....	.....	.....		
	61	2	2	2	2	2	.....	.....		
	62	3	3	3	.....	.....	.....	.....		
	63	3	3	3	3	.....	.....	.....		
	64	3	3	3	.....	.....	.....	.....		
	4	.....	.....	.....	8	8	.....	.....		
	5	.....	.....	.....	.....	.....	8	8		
Subtotal.....	.....	19	19	19	13	10	8	8	96	4,992
3 p. m. to 11 p. m. .	56	.....	.....	.....	8	8	.....	.....		
	57	8	8	8	.....	.....	8	8		
	58	8	8	8	8	.....	.....	8		
5 p. m. to 1 a. m. . .	59	6	6	6	6	.....	.....	6		
Subtotal.....	.....	22	22	22	22	8	8	22	126	6,552
11 p. m. to 7 a. m. .	59	2	2	2	2	.....	.....	2		
	60	8	8	8	8	.....	.....	8		
	61	6	6	6	6	.....	.....	6		
5 a. m. to 10 a. m. .	62	2	2	2	.....	8	8	2		
	63	2	2	2	.....	.....	.....	2		
	64	2	2	.....	.....	.....	.....	2		
Subtotal.....	.....	22	22	18	16	8	8	22	116	6,032
Total.....	.....	63	63	59	51	26	24	52	338	17,576
Driving: [3]										
7 a. m. to 3 p. m. . .	37	8	8	8	.....	.....	.....	.....		
	38	8	8	8	.....	.....	.....	.....		
	47	4	4	4	4	4	.....	.....		
	48	4	4	4	4	4	.....	.....		
	49	4	4	4	4	.....	.....	.....		

[1] Central clerking organization provides 6,027 man-hours for clerking at the cattle truck dock, 262 man-hours for clerking at the cattle rail dock, 2,272 man-hours for clerking at the hog and sheep truck dock, and 175 man-hours for clerking at the hog and sheep rail dock.

[2] Checking at cattle truck dock 16,633 man-hours, and checking at cattle rail dock 943 man-hours.

[3] Driving at the cattle truck dock 28,241 man-hours, weighing direct cattle 935 man-hours, unloading, loading, pen catching and driving at cattle rail dock 776 man-hours.

TABLE 80.—*Assumed schedule for workers by divisions, operating cycles, jobs, work shifts, and day of week*—Continued

Item	Worker number	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	Weekly total	Yearly total
		Man-hours	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*
Driving:	50	4	4	4	.....	.....	.....	.....		
7 a. m. to 3 p. m.	9	.....	.....	.....	.....	8	8	8		
—Continued	14	.....	.....	.....	.....	8	8	8		
	18	.....	.....	.....	8	.....	.....	.....		
	23	.....	.....	.....	8	.....	.....	.....		
Subtotal	.....	32	32	32	28	24	16	16	180	9,360
3 p. m. to 11 p. m.	37	.....	.....	.....	8	8	.....	.....		
	38	.....	.....	.....	8	8	.....	.....		
	39	8	8	8	.....	.....	8	8		
	40	8	8	8	.....	.....	8	8		
	41	.....	.....	.....	.....	.....	.....	8		
5 p. m. to 1 a. m.	42	6	6	6	6	.....	.....	6		
	43	6	6	6	6	.....	.....	6		
	44	6	6	6	.....	.....	.....	.....		
	51	.....	.....	.....	.....	.....	.....	8		
Subtotal	.....	34	34	34	28	16	16	44	206	10,712
11 p. m. to 7 a. m.	42	2	2	2	2	.....	.....	2		
	43	2	2	2	2	.....	.....	2		
	44	2	2	2	8	8	.....	.....		
	45	8	8	8	.....	.....	8	8		
	46	8	8	.....	.....	8	8	8		
3 a. m. to 11 a. m.	47	4	4	4	4	.....	.....	4		
	48	4	4	4	4	.....	.....	4		
	49	4	4	4	.....	.....	.....	4		
	50	4	4	.....	.....	.....	.....	4		
Subtotal	.....	38	38	26	20	16	16	36	190	9,880
Total	.....	104	104	92	76	56	48	96	576	29,952
Total—Receiving cattle by truck	.....	191	191	175	151	106	96	172	1,082	56,264
Weighing cattle:										
Weighmaster	1	8	8	8	8	4	.....	.....		
	2	8	8	8	4	.....	.....	.....		
	3	8	8	8	.....	.....	.....	.....		
	4	8	8	.....	.....	.....	.....	.....		
	5	8	4	4	.....	.....	.....	.....		
Subtotal	.....	40	36	28	12	4	.....	.....	120	6,240
Backgate man	6	8	8	8	8	4	.....	.....		
	7	8	8	8	4	.....	.....	.....		
	8	8	8	8	.....	.....	.....	.....		
	9	8	8	.....	.....	.....	.....	.....		
	10	8	4	4	.....	.....	.....	.....		
Subtotal	.....	40	36	28	12	4	.....	.....	120	6,240
Counter	11	8	8	8	8	4	.....	.....		
	12	8	8	8	4	.....	.....	.....		
	13	8	8	8	.....	.....	.....	.....		
	14	8	8	.....	.....	.....	.....	.....		
	15	8	4	4	.....	.....	.....	.....		
Subtotal	.....	40	36	28	12	4	.....	.....	120	6,240
Driver	16	8	8	8	8	4	.....	.....		
	17	8	8	8	4	.....	.....	.....		
	18	8	8	8	.....	.....	.....	.....		
	19	8	8	.....	.....	.....	.....	.....		
	20	8	4	4	.....	.....	.....	.....		
Subtotal	.....	40	36	28	12	4	.....	.....	120	6,240
Pen catcher	21	8	8	8	8	4	.....	.....		
	22	8	8	8	4	.....	.....	.....		
	23	8	8	8	.....	.....	.....	.....		

TABLE 80.—*Assumed schedule for workers by divisions, operating cycles, jobs, work shifts, and day of week*—Continued

Item	Worker number	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	Weekly total	Yearly total
		Man-hours	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*
Weighing cattle:										
Pen catcher	24	8	8	.....	.....	.....	.....	.....		
—Continued	25	8	4	4	.....	.....	.....	.....		
Subtotal	.....	40	36	28	12	4	.....	.....	120	6,240
Total weighing cattle	.....	200	180	140	60	20	.....	.....	600	31,200
Keying cattle:										
Keyman	65	8	8	8	8	8	.....	.....		
	66	8	8	8	.....	.....	8	8		
	67	8	8	8	8	8	.....	.....		
	41	8	8	8	8	.....	.....	.....		
Total keying cattle	.....	32	32	32	24	16	8	8	152	7,90
Loading out cattle by truck:										
Checkers:										
9 a. m. to 5 p. m.	69	8	8	8	8	8	.....	.....		
11 a. m. to 7 p. m.	70	8	8	8	.....	.....	.....	.....		
2 p. m. to 10 p. m.	71	8	8	8	8	.....	.....	.....		
Total loading out cattle by truck	.....	24	24	24	16	8	.....	.....	96	4,992
Water patrolling the cattle division:										
Water patrolmen	68	8	8	.....	.....	8	8	8		
	19	.....	.....	8	8	.....	.....	.....		
Total water patrolmen	.....	8	8	8	8	8	8	8	56	2,912
Fire patrolling the cattle division:										
Fire patrolmen	1	.....	.....	.....	.....	4	.....	.....		
	2	.....	.....	.....	4	.....	.....	.....		
	4	.....	.....	8	.....	.....	.....	.....		
	5	.....	4	4	.....	.....	.....	.....		
	70	.....	.....	.....	8	8	.....	.....		
	110	3	.....	.....	.....	.....	.....	.....		
	115	3	.....	.....	.....	.....	.....	.....		
Total fire patrolmen	.....	6	4	12	12	12	.....	.....	46	2,392
Cleaning the cattle division:										
Cleaning workers	6	.....	.....	.....	.....	4	.....	.....		
	7	.....	.....	.....	4	.....	.....	.....		
	10	.....	4	4	8	8	.....	.....		
	11	.....	.....	.....	.....	4	.....	.....		
	12	.....	.....	.....	4	.....	.....	.....		
	15	.....	4	4	8	8	.....	.....		
	16	.....	.....	.....	.....	4	.....	.....		
	17	.....	.....	.....	4	8	.....	.....		
	18	.....	.....	.....	.....	8	.....	.....		
	19	.....	.....	.....	.....	8	.....	.....		
	20	.....	4	4	8	8	.....	.....		
	21	.....	.....	.....	.....	4	.....	.....		
	22	.....	.....	.....	4	8	.....	.....		
	23	.....	.....	.....	.....	8	.....	.....		
	24	.....	.....	8	8	8	.....	.....		
	25	.....	4	4	8	8	.....	.....		
	27	.....	.....	8	.....	.....	.....	.....		
	28	.....	.....	8	.....	.....	.....	.....		
	35	8	8	8	8	.....	.....	.....		
	36	8	8	8	8	.....	.....	.....		
	49	.....	.....	.....	.....	8	.....	.....		
	50	.....	.....	.....	8	8	.....	.....		
	62	3	3	3	.....	.....	.....	.....		
	63	3	3	3	3	8	.....	.....		
	64	3	3	3	8	8	.....	.....		
	110	.....	4	.....	.....	.....	.....	.....		

TABLE 80.—*Assumed schedule for workers by divisions, operating cycles, jobs, work shifts, and day of week*—Continued

Item	Worker number	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	Weekly total	Yearly total
		Man-hours	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*
Cleaning the cattle division:										
Cleaning workers —Continued	115	.....	4	.....	.....	.....	.....	.....		
Total cleaning ..	.....	25	49	65	91	128	.....	.....	358	18,616
Total Cattle Division.....	.....	486	488	456	362	298	112	188	2,390	124,280
Hog and Sheep Division:										
Receiving hogs and sheep by truck:										
Clerking: (Listed in clerking labor distribution).										
Checking: [4]										
7 a. m. to 3 p. m. ..	119	8	8	8	8	8	.....	.....		
	125	4	4	4	.....	.....	.....	.....		
	126	4	4	4	.....	.....	.....	.....		
	127	4	4	4	.....	.....	.....	.....		
	128	4	4	4	.....	.....	.....	.....		
	114	.....	.....	.....	.....	.....	8	8		
Subtotal.....	.....	24	24	24	8	8	8	8	104	5,408
3 p. m. to 11 p. m. .	120	8	8	8	.....	.....	8	8		
	121	8	8	8	.....	.....	8	8		
	115	.....	.....	.....	8	8	.....	.....		
	118	.....	.....	.....	8	8	.....	.....		
Subtotal.....	.....	16	16	16	16	16	16	16	112	5,824
11 p. m. to 7 a. m. .	122	8	8	8	.....	.....	8	8		
	123	8	.....	.....	8	8	8	8		
	124	.....	8	8	8	8	.....	.....		
	125	2	2	.....	.....	.....	.....	2		
	126	2	2	.....	.....	.....	.....	2		
	127	2	2	.....	.....	.....	.....	2		
Subtotal.....	.....	22	22	16	16	16	16	22	130	6,760
Total.....	.....	62	62	56	40	40	40	46	346	17,992
Driving:										
7 a. m. to 3 p. m. ..	.....	.....	.....	.....	.....	.....	.....	.....		
3 a. m. to 11 a. m. .	133	4	4	4	4	4	.....	.....		
3 p. m. to 11 p. m. .	.....	.....	.....	.....	.....	.....	.....	.....		
11 p. m. to 7 a. m. .	.....	.....	.....	.....	.....	.....	.....	.....		
3 a. m. to 11 a. m. .	133	4	4	4	4	.....	.....	4		
Total.....	.....	8	8	8	8	4	.....	4		
Total—Receiving hogs and sheep by truck	.....	70	70	64	48	44	40	50	386	20,072
Weighing hogs and sheep:										
Market hogs:										
Backgateman.....	109	4	4	3	2	1	.....	.....		
Weighmaster.....	105	4	4	3	2	1	.....	.....		
Counter.....	106	4	4	3	2	1	.....	.....		
Driver.....	107	4	4	3	2	1	.....	.....		
Pen catcher.....	108	4	4	3	2	1	.....	.....		
Subtotal.....	.....	20	20	15	10	5	.....	.....	70	3,640
Market sheep:										
Backgateman.....	129	5	4	3	3	1	.....	.....		
	114	5	4	3	.....	.....	.....	.....		
Weighmaster.....	110	5	4	3	3	1	.....	.....		
	115	5	4	3	.....	.....	.....	.....		
Counter.....	111	5	4	3	3	1	.....	.....		
	116	5	4	3	.....	.....	.....	.....		

[4] Checking at the hog and sheep truck dock, 16,127 man-hours; checking at the hog and sheep rail dock, 422 man-hours; unloading, loading, pen catching, and driving at the hog and sheep rail dock, 233 man-hours; and weighing direct hogs and sheep, 1,210 man-hours.

TABLE 80.—*Assumed schedule for workers by divisions, operating cycles, jobs, work shifts, and day of week*—Continued

Item	Worker number	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	Weekly total	Yearly total
Weighing hogs and sheep:		*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*
Market hogs: —Continued										
Driver	112	5	4	3	3	1				
	117	5	4	3						
Pen catcher	113	5	4	3	3	1				
	118	5	4	3						
Subtotal		50	40	30	15	5			140	7,280
Total—Weighing hogs and sheep		70	60	45	25	10			210	10,920
Keying hogs and sheep:										
Keyman	124	8								
	134		8	8	8	8	8			
	135	8	8	8	8	8				
Total—keying hogs and sheep		16	16	16	16	16	8		88	4,576
Water patrolling:										
Water patrolmen	130	8	8	8	8	8				
Total—Water patrolmen		8	8	8	8	8			40	2,080
Fire patrolling:										
Fire patrolmen	105	4	4	4	4	4				
Total—Fire patrolmen		4	4	4	4	4			20	1,040
Cleaning:										
Cleaning workers [5]	105			1	2	3				
	106	4	4	5	6	7				
	107	4	4	5	6	7				
	108	4	4	5	6	7				
	109	4	4	5	6	7				
	110			5	5	7				
	111	3	4	5	5	7				
	112	3	4	5	5	7				
	113	3	4	5	5	7				
	129	3	4	5	5	7				
	115			5						
	116	3	4	5						
	117	3	4	5						
	118	3	4	5						
	114	3	4	5						
	126	2	2	2	8	8				
	127	2	2	2	8	8				
	125	2	2	2	8	8				
	128	4	4	4	8	8				
Total		50	58	81	83	98			370	19,240
Total Hog and Sheep Division		218	216	218	184	180	48	50	1,114	57,928
Yard Services:										
Feeding livestock:										
Clerking:										
7 a. m. to 4 p. m.	26	8	8	8			8	8		
	3				8	8				
Subtotal		8	8	8	8	8	8	8	56	2,912
Delivering feed [6]:										
7 a. m. to 4 p. m.	27	8	8				8	8		
	28	8	8				8	8		
	8				8	8				
	13				8	8				
	29	8	8	8			8	8		
	30	8	8	8			8	8		
	7					8				
	12					8				
	31	8	8	8	8			8		

[5] Cleaning in the hog and sheep division, 18,595 man-hours; vaccinating and spraying hogs and dipping sheep, 645 man-hours.

[6] Feeding livestock, 33,239 man-hours; unloading, loading, pen catching, and driving at the cattle rail dock, 457 man-hours.

TABLE 80.—*Assumed schedule for workers by divisions, operating cycles, jobs, work shifts, and day of week*—Continued

Item	Worker number	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	Weekly total	Yearly total
		Man-hours	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*
Delivering feed:										
7 a. m. to 4 p. m.	32	8	8	8	8	.....	.....	8		
—Continued	33	8	8	8	8	.....	.....	8		
	34	8	8	8	8	.....	.....	8		
	35	.....	.....	.....	.....	.....	.....	8		
	36	.....	.....	.....	.....	.....	.....	8		
	131	8	8	8	.....	.....	8	8		
	132	8	8	8	.....	.....	8	8		
	117	.....	.....	.....	8	8	.....	.....		
	116	.....	.....	.....	8	8	.....	.....		
Subtotal	.....	80	80	64	64	48	48	96	480	24,960
4 p. m. to 12 p. m.	51	8	8	8	8	.....	.....	.....		
	72	.....	.....	.....	.....	8	8	8		
Subtotal	.....	8	8	8	8	8	8	8	56	2,912
12 p. m. to 8 a. m.	72	8	8	.....	.....	.....	.....	.....		
	73	.....	.....	8	8	8	8	8		
Subtotal	.....	8	8	8	8	8	8	8	56	2,912
Total—Delivering feed	.....	96	96	80	80	64	64	112	592	30,784
Total—Feeding livestock	.....	104	104	88	88	72	72	120	648	33,696
Maintenance:										
Plumbers	82	8	8	8	8	8	.....	.....		
	83	.....	8	8	8	8	8	.....		
Subtotal	.....	8	16	16	16	16	8	.....	80	4,160
Electrician	84	8	8	8	8	8	.....	.....	40	2,080
Mechanic	85	8	8	8	8	8	.....	.....	40	2,080
Maintenance Crew	86	8	8	8	8	8	.....	.....		
	87	8	8	8	8	8	.....	.....		
	88	8	8	8	8	8	.....	.....		
	89	8	8	8	8	8	.....	.....		
	90	8	8	8	8	8	.....	.....		
	91	8	8	8	8	8	.....	.....		
	92	8	8	8	8	8	.....	.....		
	93	8	8	8	8	8	.....	.....		
	94	8	8	8	8	8	.....	.....		
Subtotal	.....	72	72	72	72	72	.....	.....	360	18,720
Total—Maintenance	.....	96	104	104	104	104	8	.....	520	27,040
Watchman Services:										
Exchange Building:										
7:30 p. m. to 7 a. m.	74	11	11	11	.....	.....	.....	11		
	75	.....	.....	.....	11	11	11	.....		
Subtotal	.....	11	11	11	11	11	11	11	77	4,004
ADT:										
6 p. m. to 5:30 a. m.	76	.....	11	11	11	11	.....	.....		
	77	11	11	.....	.....	.....	11	11		
	78	.....	.....	11	11	11	11	.....		
	75	.....	.....	.....	.....	.....	.....	11		
	81	11	.....	.....	.....	.....	.....	.....		
Subtotal	.....	22	22	22	22	22	22	22	154	8,008
Fire Patrol:										
6:30 a. m. to 6 p. m.	79	11	11	.....	.....	.....	11	11		
6 p. m. to 5:30 a. m.	80	11	11	11	11	.....	.....	.....		
	81	.....	.....	.....	.....	11	11	11		
Subtotal	.....	22	22	11	11	11	22	22	121	6,292
Total—Watchman services	.....	55	55	44	44	44	55	55	352	18,304

TABLE 80.—*Assumed schedule for workers by divisions, operating cycles, jobs, work shifts, and day of week*—Continued

Item	Worker number	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	Weekly total	Yearly total
		Man-hours	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*	*Man-hours*
Central labor pool: [7]										
7 a. m. to 3 p. m. . .	95	8	8	8	8	8	.....	.....		
	96	8	8	8	.....	.....	8	8		
	97	8	8	8	8	8	.....	.....		
	98	8	8	8	8	8	.....	.....		
	99	8	8	8	8	8	.....	.....		
	100	8	8	8	.....	.....	.....	.....		
	101	8	8	.....	.....	.....	.....	.....		
Subtotal.....	.....	56	56	48	32	32	8	8	240	12,480
3 p. m. to 11 p. m. .	100	.....	.....	.....	8	8	.....	.....		
	101	.....	.....	8	8	8	.....	.....		
	102	8	8	.....	.....	.....	8	8		
	103	8	8	8	.....	.....	8	8		
	71	.....	.....	.....	.....	.....	.....	8		
Subtotal.....	.....	16	16	16	16	16	16	24	120	6,240
11 p. m. to 7 a. m. .	102	.....	.....	.....	8	.....	.....	.....		
	104	8	8	8	.....	8	.....	8		
Subtotal.....	.....	8	8	8	8	8	.....	8	48	2,496
Total—Labor pool.....	.....	80	80	72	56	56	24	40	408	21,216
Grand total.....	.....	1,039	1,047	982	838	754	319	453	5,432	282,464

[7] Labor pool, 12,241 man-hours; hog and sheep rail checking, 578; hog and sheep direct weighing, 386; receiving and shipping hogs and sheep by rail, 3,136; receiving and shipping cattle by rail, 3,107, cleaning, 1,768.

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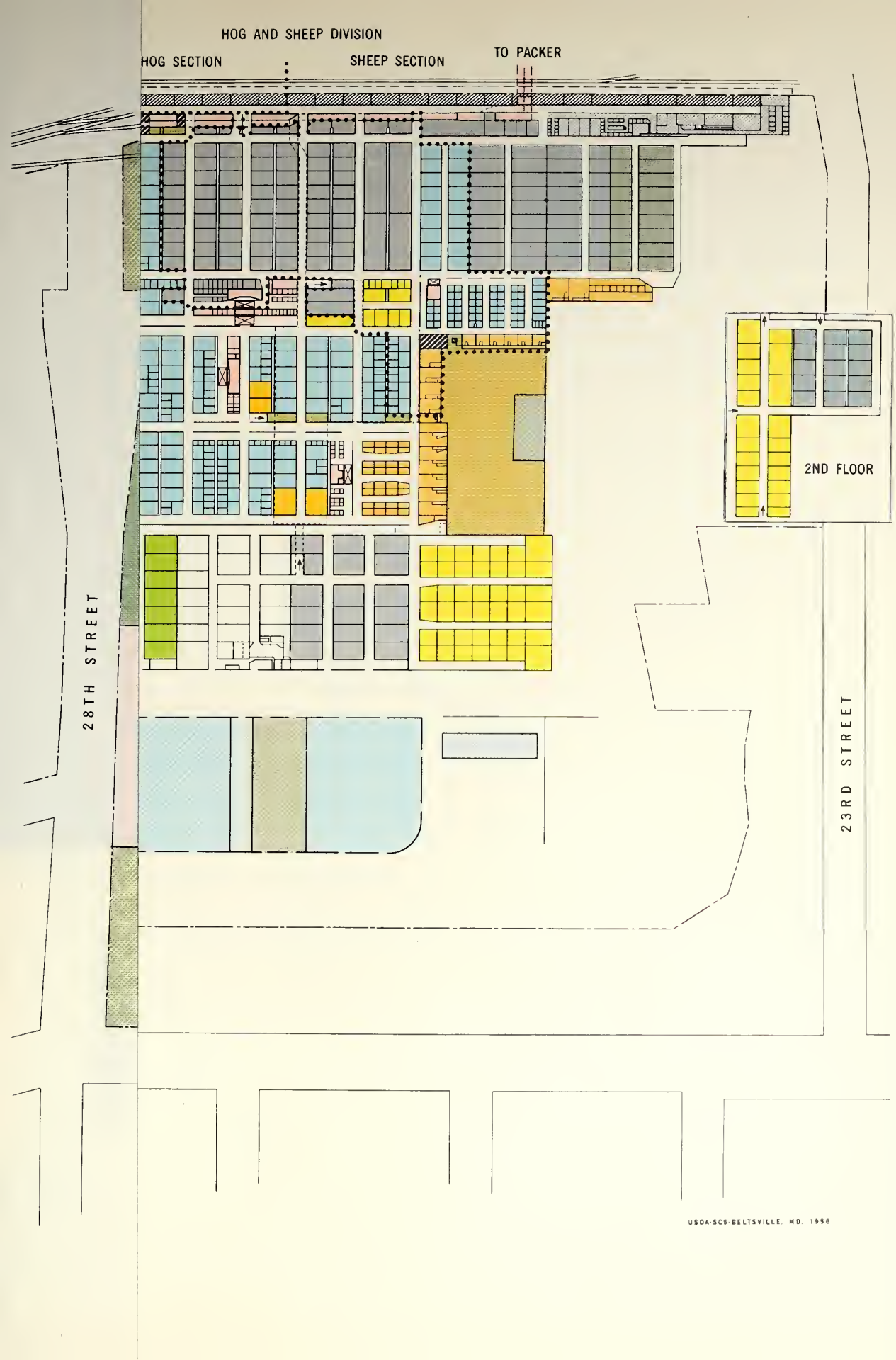

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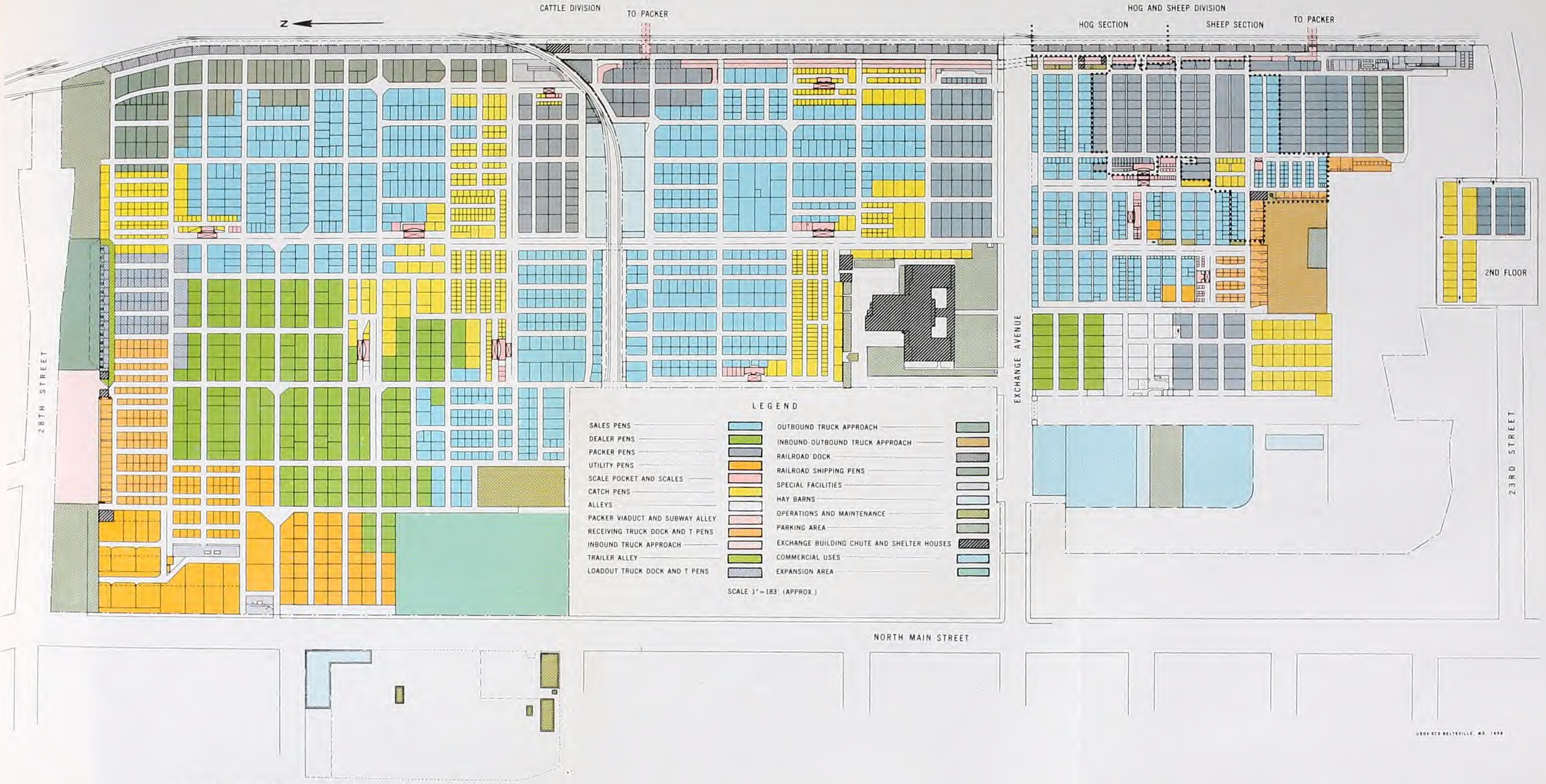
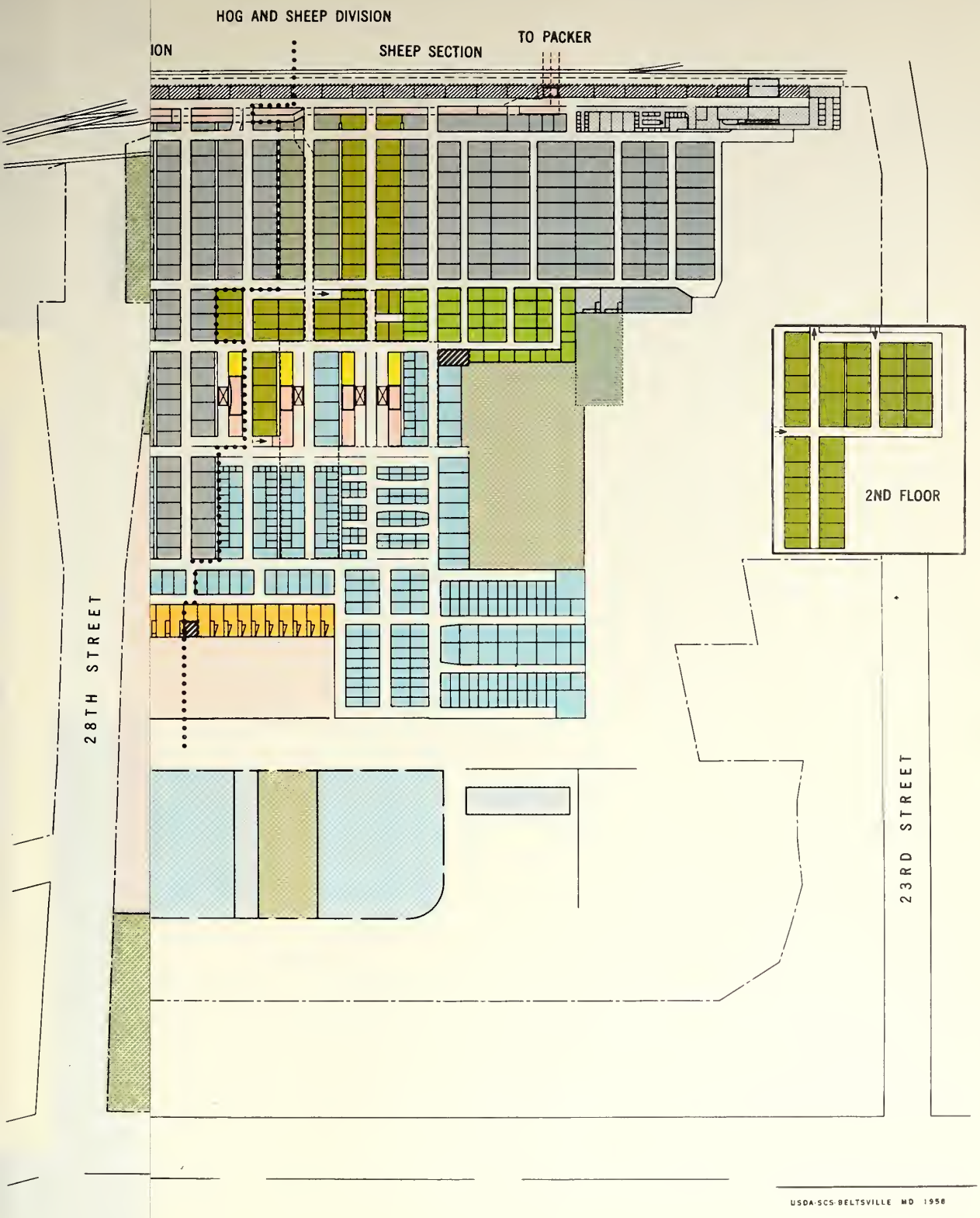


FIGURE 4. PRESENT LAYOUT OF THE FORT WORTH STOCKYARDS



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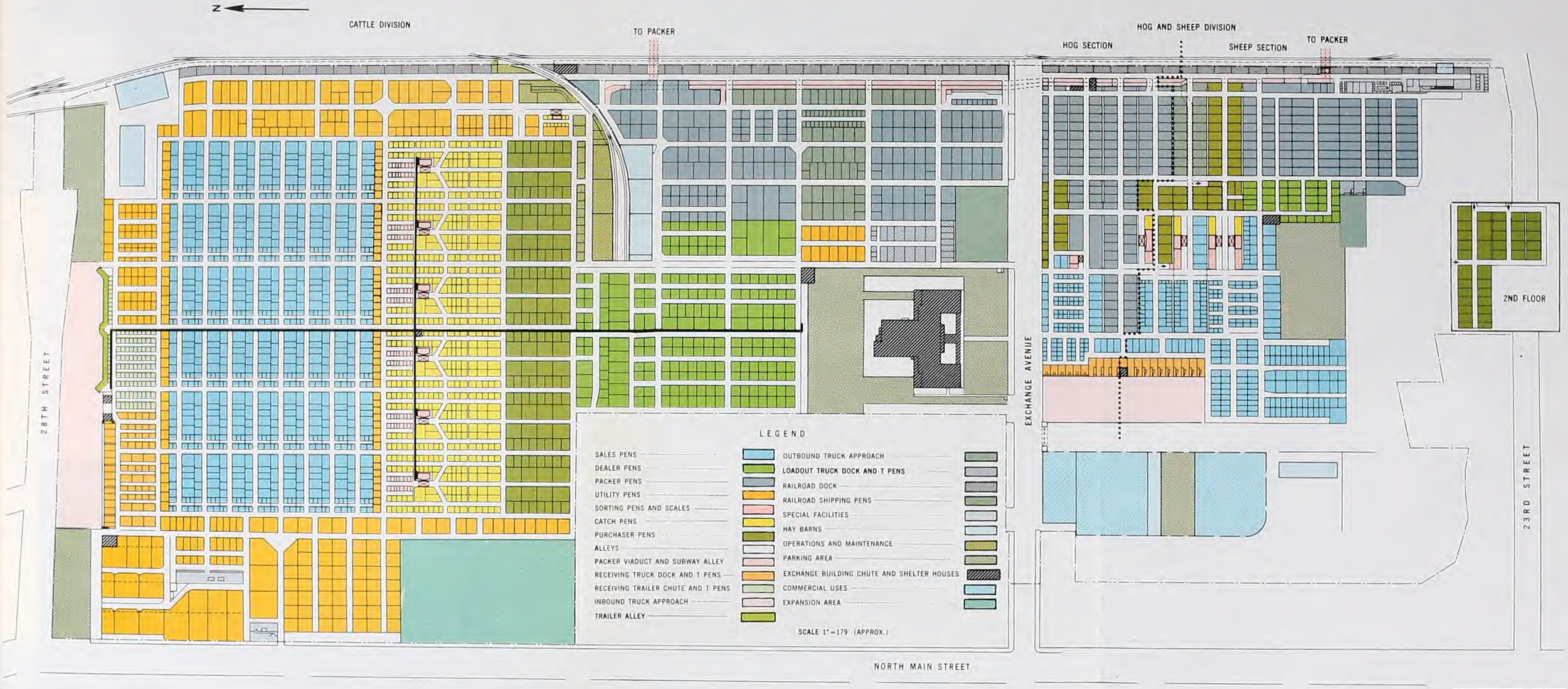

FIGURE 43. SUGGESTED LAYOUT OF THE FORT WORTH STOCKYARDS